

MARINE REVIEW.

Vol. XIV.

CLEVELAND, O., SEPTEMBER 17, 1896.

No. 12.

The Hannas of Cleveland.

Since M. A. Hanna of Cleveland undertook, some time ago, the task of electing Major McKinley of Ohio to the presidency, attention has been directed to his ability as a business man and his genius as an organizer. On the lakes it is known, of course, that although not heard of in politics, Mr. Hanna's two brothers, H. M. Hanna and L. C. Hanna, have shared success with him in business, and have accumulated, along the same lines, fortunes about equal to that of the Republican leader. The fourth member of the accompanying group, D. R. Hanna, is a son of the political manager. He found a place awaiting him in the firm of M. A. Hanna & Co., a few years ago, and has since taken an active part in managing its affairs.

But no advantage, even of this kind, was offered the older members of the family.

They attained wealth and prominence through their own efforts, and especially through a careful application to business. H. M. Hanna is not a member of the firm of M. A. Hanna & Co., but he is closely associated with his brothers in nearly all other enterprises, especially in the ownership of vessel property and in the interest which they hold in the Globe Iron Works Co. of Cleveland.

The Hannas have been associated with the development of lake commerce for nearly half a century. Last year the firm of M. A. Hanna & Co. handled, as agents, 2,100,000 gross tons of iron ore. In this great volume of business they represented about twenty iron mining companies, in some of which they are leading stockholders. Much of this ore was moved in ships which they own and over railway terminals—iron ore and coal docks—which they control at ports on Lake Erie. Their iron furnace interests include two furnaces at Sharpsville, Pa., another at Newcastle, Pa., and a fourth at Buffalo. They operate for the Mutual and Menominee transportation companies, in which they hold a controlling interest, nine steel steamers engaged mainly in the ore trade of the lakes, and valued collectively at about \$1,575,000. They are controlling owners of the Globe Iron Works Co. of Cleveland, a ship building concern that has built, during the past eight or nine years, sixty-seven steel vessels, ranging in value from \$150,000 to \$250,000 each, and two of them, passenger ships, costing about \$950,000 each. In addition to this, M. A. Hanna personally owns the greater part of one of the two street railway systems in Cleveland, and all of the brothers are connected with other local enterprises of a less important kind.

Leonard Hanna, father of the brothers who have built up these several business interests, came to Cleveland in 1852 from New Lisbon, O., where the brothers were born. New Lisbon was a part of Ohio noted on account of a Quaker settlement. Leonard Hanna's family were members of the Society of Friends, but he lost his right in the faith upon marrying outside the church. His sons have never shown a disposition to follow in the footsteps of their New Lisbon ancestors.

Upon coming to Cleveland, Leonard Hanna, who had been a physician in New Lisbon, established a wholesale grocery business. He was senior member of the firm of Hanna, Garretson & Co. This firm afterward built up a big forwarding business in the trade to Lake Superior, which was all by boat from Cleveland up to about 1870.

Previous to 1870 freight destined to the Lake Superior country was all shipped through Cleveland. Little was heard of Buffalo in the Lake Superior trade. Leonard Hanna died in 1862, but by this time the sons, Mark especially, were getting along to an age at which they were able to take advantage of the start afforded them in the mercantile business that had been left them. Mark Hanna followed up the interest of the estate in the firm of Hanna, Garretson & Co. and Robert Hanna & Co., and still later in Rhodes & Co. H. M. Hanna entered the navy, and after the war formed a strong friendship with Col. Oliver Payne, son of the late Senator H. B. Payne. Col. Payne had been in the army. The two men were congenial in character. Col.

Payne became a power in the Standard Oil Co., and it was quite generally understood that his friend, H. M. Hanna, who had also been in the oil business on a moderate scale, profited by a sale to the Standard and also by stock which he acquired in the early days of that big concern.

During all this time the Hanna brothers kept increasing their interests in vessel property on the lakes. In 1873-74 they built a line of eight wooden vessels (known as the black line), on a three years' contract with the Cleveland Iron Mining Co., to carry ore from Marquette to Cleveland, Ashtabula and Erie at \$3 to \$3.50 a ton. The rate at which ore between these points is being carried to-day is 50 cents a ton. This is a very low rate but there would be a good profit in the business now at considerable less than a dollar a ton. These wooden vessels were followed later on by others of the modern steel type, and the various interests in mines, docks and furnaces referred



to above were acquired through the relations which the lake trade bears to these branches of the iron and steel business.

For several years past, L. C. Hanna, youngest of the brothers in the accompanying group, has had direct charge of the iron ore and vessel business. He has given more attention to details than either of the other brothers. His duties have been very extensive, but alike to other members of the family, he developed the faculty of building up a strong organization by keeping men of ability, at liberal salaries, in charge of the various departments over which he is the supervisor. No manager on the lakes is better posted than he is regarding the iron industry, and especially that part of it pertaining to the mining and transportation of ore. Mark Hanna is fifty-nine years of age, H. M. Hanna is fifty-six and L. C. Hanna is forty-five. Among old friends and business associates they are familiarly known as Mark, Mel and Doc.

Whatever may be said of the Republican manager by opponents in the political campaign, it is certainly the opinion of business men here, who know him well, that he has no special personal end in view, and that he is a patriot in national politics as he has been in local and state campaigns, always contributing to republican success but never seeking office.

Mr. Holloway's Early Life.

In the last issue of the Review reference was made to the death of Mr. J. F. Holloway and his connection with marine engineering on the lakes. A letter from Mr. T. R. Hutton, secretary of the American Society of Mechanical Engineers, New York, treats of Mr. Holloway's life before he was connected with the Cuyahoga steam Furnace Co. of Cleveland. Mr. Hutton says:

"Mr. Holloway's father was originally from Pennsylvania and marrying there he thought to better his condition by moving to Ohio. Mr. J. F. Holloway was born Jan. 18, 1825, in Uniontown, Ohio, where he lived until he was six years old, when he moved with his father as a pioneer to what was known as the Western Reserve. The settlement was made on the banks of the Cuyahoga river, near where is now the town of Cuyahoga Falls, which at that time had only six houses in the midst of the wilderness. The place afforded meager opportunities for education at school, but as most of the early settlers were refined and cultured people from Connecticut, many of the standard works of literature were to be had among the families and Mr. Holloway's tastes and appreciation of the best in literature had its source in his earliest days. He was apprenticed to learn his trade to a firm of engine builders in Cuyahoga Falls and was considered their most capable apprentice. His first absence from home was for a year in Cabotville, Mass., but at different periods of his early life he was engaged at Wilmington Del., where he designed a steamboat engine; at Cumberland, Md., as manager of a coal mining company; and for several years he was general manager of a coal mining and iron manufacturing company at Shawneetown, Ill. This company was organized by the firm of Sellers of Philadelphia. He then entered the employ of the Cuyahoga Steam Furnace Co. of Cleveland and on the death of Mr. W. B. Castle, in 1872, he became president and superintendent of the company, conducting the works in the interest of the other stock holders, of whom he stood as a representative and protector."

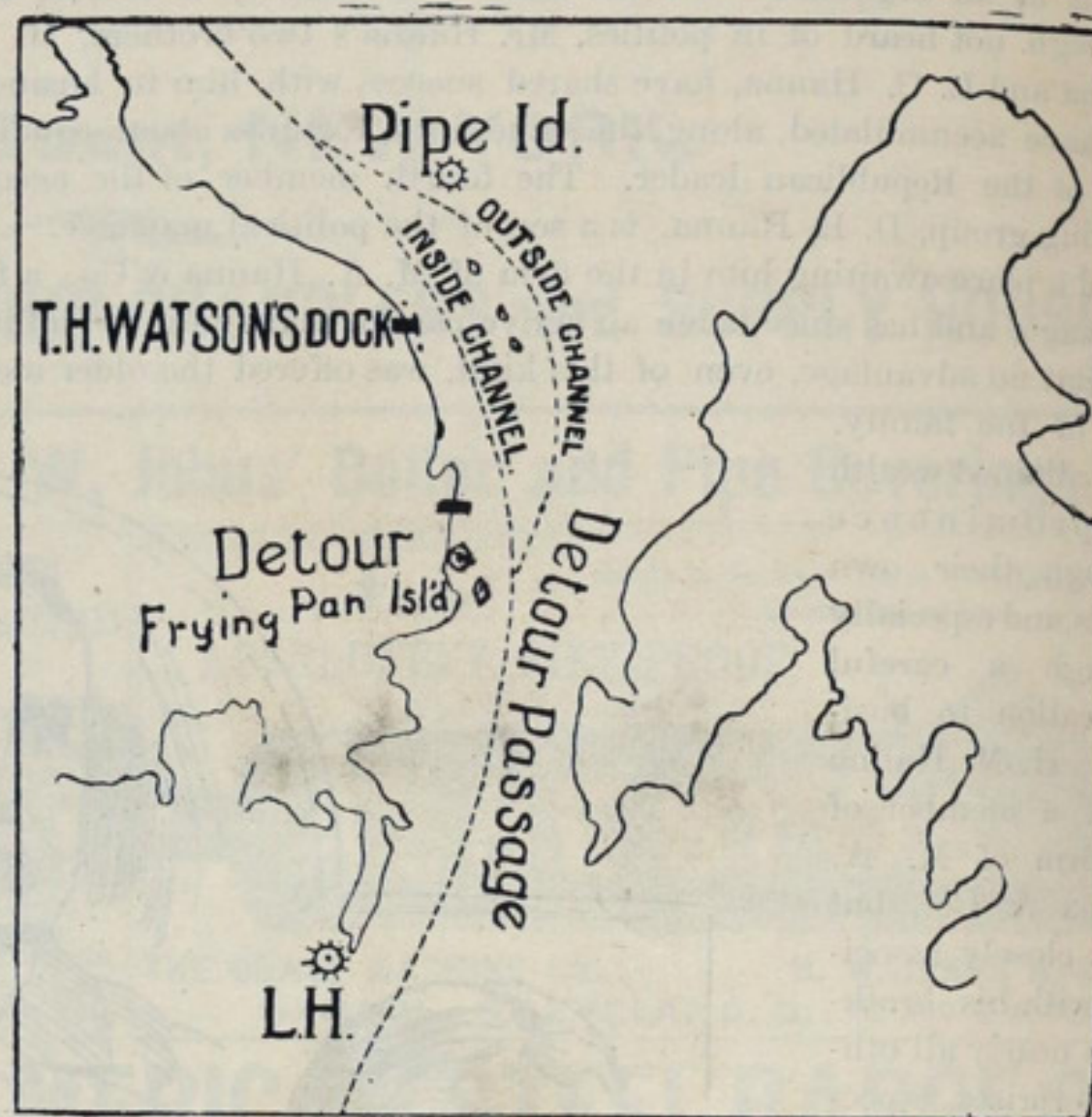
Repairs to the Wm. Chisholm.

The steel steamer Wm. Chisholm, which was sunk in collision near Detroit with the Oceanica, is again in commission, after spending thirteen days in the dock of the Cleveland Dry Dock Co. When repair bills, amounting in some cases to \$20,000 or more, are paid by the insurance companies on wrecks of this kind, that are hurried into commission within a couple of weeks, it is difficult to comprehend the amount of work involved. But the labor force, much of it of a high-priced kind, that is put onto a job like that of repairing the Chisholm, is always very large. The Globe Iron Works Co. has accomplished a big amount of work within a short period in this case, as shown by the following details: Frames and floors straightened in place, 25; new floor plates, 80; new frames and straps, 115; new stanchions, 10; repaired stanchions, 6; stringer plates straightened and put back, 3; stringer plates, new, 4; waterway and stringer angles, new, 4; fender angles, new, 4; beams, new, 4; side lights, new, 2; new shell plates, 25; rolled shell plates, put back, 52; rolled shell butt straps, 52; new butt straps, 20; total new pieces, 406. In addition to the above, 100

feet of new fender was put on the Chisholm and half of the after cabin made new. Details are not at hand regarding engine room repairs, but it is known that the engine and piping were badly damaged. A new wheel hub was also supplied.

New Sault River Coal Dock.

Another steamboat fuel dock on the Sault river seeks the patronage of vessel men, and offers, upon trial, to prove advantages of the dock, as well as the high quality of coal to be supplied. The dock is known as the Watson coal dock, and is located, as shown in the accompanying diagram, about a mile above Detour. Such steamers as the Harvey H. Brown, W. D. Rees, John Craig, Australasia,



City of Naples and City of Genoa have already taken on fuel at this dock, so that there is no question as to abundance of water and ample facilities. Captains of these vessels all speak of good dispatch and courteous treatment. The dock has 315 feet frontage, with five pockets of 450 tons capacity, in the center, enabling boats bound up or down to stop for fuel without inconvenience. The inside channel by this dock is 30 feet deep, clear through, and is 600 feet wide, with full 22 feet at the dock. The middle ground, composed of clay, is marked for the inside channel by buoys, set in 16 feet of water. The lower end of the middle ground is marked at night by a buoy carrying a light. The Inter-Ocean Coal and Coke Co. of Cleveland, whose officers are connected with this enterprise, announce that they will keep at the dock at all times a liberal supply of the choicest grade of Youghiogheny coal of their own production, to be sold at the lowest market prices. David Barnheisel and Mark H. Hanlon of the Inter-Ocean Coal & Coke Co. are veterans in the steamboat fuel business. They have been associated with this branch of the lake trade in Cleveland for more than twenty-five years.

Miscellaneous Matters.

The Harlan & Hollingsworth Co., Wilmington, Del., is putting down keels for two new steel vessels—a ferry boat, 150 feet long, to be engined by the Pusey & Jones Co., and a steam pilot boat, 155 feet long, for pilots of New York and New Jersey.

H. J. McCarthy has been appointed chief steward of the Goodrich line. He will have entire supervision of the steward's department, and will see that stores are properly taken care of and that the table service is all that it should be on every vessel in the line. Mr. McCarthy was the winner of the first prize for efficiency in the steward's department while on one of the Goodrich boats last season.

Geo. D. Fellows of Racine, Wis., says in a letter to the Review: "I desire to warn vessels seeking shelter in Bailey's harbor of the location of the sunken schooner Emeline, which was found in mid-lake about a month ago, and towed into the harbor. She lies in 20 feet of water a little to the westward of the range, about three-quarters of a mile S. S. E. from the north pier. Vessels entering should keep pretty well to the eastward of the range after getting inside the shoals. This wreck should be removed."

Capt. Wm. S. Mack.

It can truthfully be said that the death of Capt. Wm. S. Mack, which occurred at his home in Cleveland on the 14th inst., is seriously and sincerely deplored by the vessel owners and those who knew him in all parts of the lakes. He was full of resolute energy and possessed of a capacity for labor that was apparently almost boundless. It was these qualities that caused him to follow up, with untiring persistence and zeal, every measure that tended towards the advancement of lake commerce. A striking and agreeable trait of his character was that of unfaltering loyalty to those who won his friendship. Although some-



times merciless in his criticisms of opponents, especially government officials who might differ with him in matters requiring a practical knowledge of the vessel business, he rarely lost the friendship and never the respect of those whom he thus criticised. The quality of selfishness was foreign to his nature. He was generous almost to a fault. To the young man in business he was always a friend and helper.

Capt. Mack was fifty-two years of age. He was born near Kingston, Ont., but spent his boyhood in Oswego, or rather on vessels trading out of that port, as he began sailing when very young. At twenty-one years of age he was master of the schooner *Norwegian*, owned by M. M. Wheeler of Oswego, and he sailed several vessels owned on Lake Ontario before coming to Cleveland, some eighteen years ago. The first vessel in which he secured an interest in Cleveland was the *James Couch*, a schooner of about 1,200 tons capacity. His share in the *Couch* gave him a start as a vessel owner. A little later he obtained an interest in the steamer *Raleigh*, which he sailed for one season, and then as part owner of the *Aurora*, with John Corrigan of Cleveland, he superintended the building of that steamer. After selling his interest in the *Aurora*, in 1888, he had the steamer *Schoolcraft* for a short time, but was most successful when he obtained, later on, control of vessels like the *Ballentine*, *Moonlight*, *Ironton*, *Kershaw* and *Pelican*. These vessels were not of the best class, even while Capt. Mack owned them, but they made money enough to enable him to bring together, since he quit sailing about four years ago, a much better wooden fleet. At the time of his death he was managing owner of the steamers *Geo. W. Roby*, *P. P. Pratt*, and *V. H. Ketchum*, and schooners *Becker*, *Annie M. Ash* and *Wadena*.

The high esteem in which Capt. Mack was held by his associates is shown by the action of commercial bodies in Cleveland and

vessel owners in all parts of the lakes. Resolutions and memorials were adopted by vessel owners of Detroit, Chicago and Buffalo, and in Cleveland special meetings were held by the Lake Carrier's Association, Ship Masters' Association, Cleveland Chamber of Commerce and the Maritime Board, which is an auxiliary organization in the chamber. Capt. Mack was chairman of the Maritime Board and first vice-president of the grand lodge, Ship Masters' Association. It was agreed by all of these organizations that penants and flags on vessels be carried at half mast on the day of the funeral. Attendance at the funeral was very large. The pall bearers were W. H. Becker, F. R. Seager, E. R. Darrow, Capt. George P. McKay, Capt. W. A. Collier and Harvey D. Goulder. The tribute of the Lake Carriers' Association to the memory of Capt. Mack is as follows:

"Capt. William S. Mack was so well known in marine circles, so closely identified with the interests of lake commerce in every branch, so active, energetic and influential, and held in such high regard by all of us, that it seems almost commonplace to adopt any formal expression of tribute to his memory. He began life with nothing but his intelligence, untiring energy, zeal and strong character. He rapidly won his way as a sailor to the position of master, filling each station with marked ability. By thrift he was able to secure a small interest, and with fine business tact and ability he rapidly increased his holding until at the time of his death he was an extensive owner and successful manager.

"For many years Capt. Mack, with the Cleveland Vessel Owners' Association, and later with the Lake Carriers' Association, was one of the leading spirits in every movement for the encouragement of lake commerce. He was generally chosen on committees for securing aids to navigation, the removal of obstructions from channels, the procuring of additional light-houses, buoys and life saving stations; he was always in demand to go with delegations to Washington on public business connected with the lakes; was called to assist in framing rules and regulations, and it was characteristic of him that he was prepared and equal to every demand, ready and willing at all times, and at whatever personal inconvenience, to contribute his time and his means to the accomplishment of any of these purposes.

"There was never a finer example of the traditional great-hearted, generous sailor; never a truer, more steadfast friend; never a more tolerant and generous opponent; never a braver or truer man than our late friend Capt. Mack. Therefore be it

"Resolved that it is with a sense of deep personal loss that we mourn the death of Capt. Mack, realizing that while the lake commercial interests have lost a most influential factor, each of us has lost a valued friend.

"That we extend our heartfelt sympathy to the widow and family of the deceased, who have lost a noble husband and kind and indulgent father, their strong counselor, guide and support.

"That the vessel owners of Cleveland attend the funeral in a body, and that the secretary of this meeting be directed to send an engrossed copy of these resolutions to the family and to furnish copies to the press."

Cargo and Speed Records—Lake Freight Ships.

Iron ore—*Coralia*, Mutual Transportation Co. of Cleveland, 5,088 gross or 5,699 net tons, Gladstone to Ashtabula, draft of 16 feet 10 inches; *S. S. Curry*, Hawgood & Avery Transit Co. of Cleveland, 4,569 tons gross or 5,117 net tons, Escanaba to South Chicago, draft of 18 feet. From Lake Superior—Steamer *Sir Henry Bessemer*, Bessemer Steamship Co. of Cleveland, 4,214 gross or 4,720 net tons, Duluth to Conneaut, draft of 14 feet 8 inches.

Grain—Steamer *Queen City*, A. B. Wolvin of Duluth, 207,000 bushels of corn, Chicago to Buffalo, 16 feet 8 inches draft; steamer *Maricopa*, Minnesota Steamship Co., Cleveland, 191,700 bushels of corn, Chicago to Buffalo. From Lake Superior—Steamer *Queen City*, A. B. Wolvin of Duluth, 157,000 bushels of wheat, equal to 4,710 net tons, Duluth to Buffalo, draft of 14 feet 8 inches.

Coal—*S. S. Curry*, Hawgood & Avery Transit Co. of Cleveland, 4,535 net tons bituminous, Conneaut to Gladstone; *Selwyn Eddy*, Eddy Bros. of Bay City, Mich., 4,252 net tons anthracite, Buffalo to Milwaukee.

Speed—*Owego*, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; *Centurion*, Hopkins Steamship Co. of St. Clair, Mich., Buffalo to Duluth, 997 miles, 65 hours and 10 minutes, 15.3 miles an hour.

Ship Yard Matters.

All but three of the Rockefeller steamers are now in the water. The boats still on the stocks are a steamer and barge at West Bay City and a steamer at the yard of the Cleveland Ship Building Co. Wheeler & Co. had planned to launch their steamer on Saturday next, but may be delayed until next week. They expect anyhow to finish her by Oct. 1, as boats at their yard are almost ready for sea when launched. Their intention regarding the barge is to have her follow about ten days after the steamer. The steamer at the Cleveland yard is nearly ready for launching.

A Detroit dispatch says: "Officers of the Detroit Dry Dock Co. are pleased with the announcement that the steamer Fairbairn, first of the Rockefeller steamers which they built, has just loaded 4,008 gross tons of ore, with 135 tons of fuel, on a mean draft of 14 feet 7 inches, or exactly what their contract called for. The Dry Dock Engine Works has just closed a contract with the copper rolling mills of this city for a set of fore-and-aft compound engines, marine type, with cylinders 16 and 32 by 36 inches."

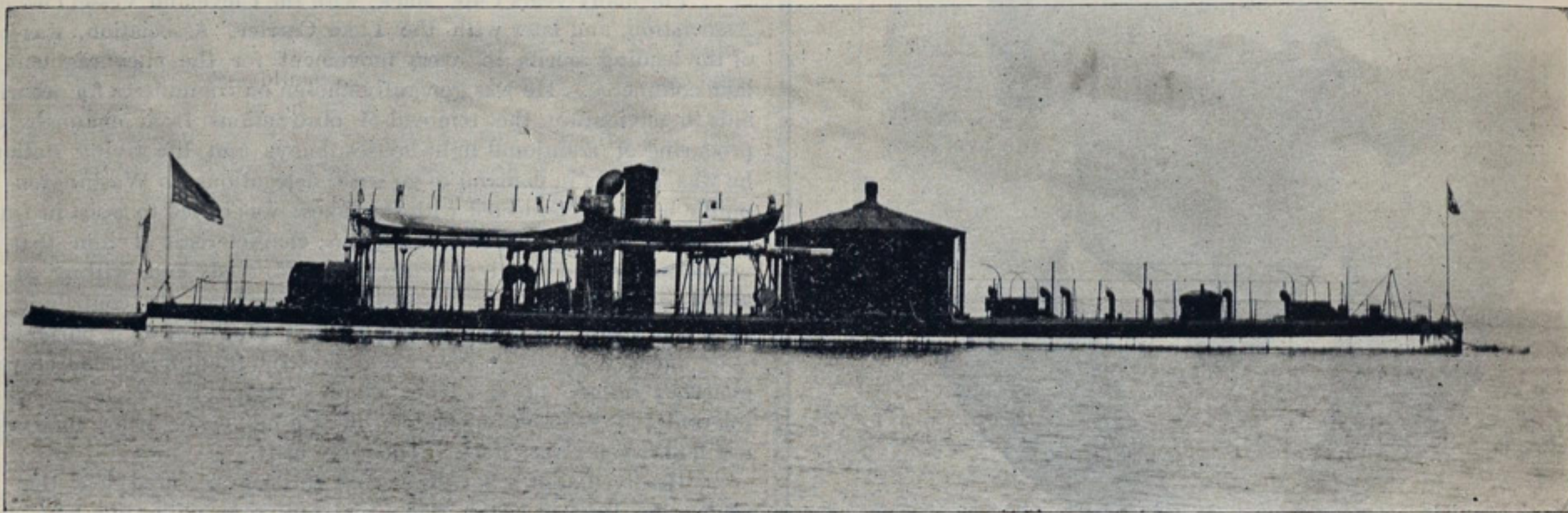
The latest report from the bureau of navigation, treasury department, giving tonnage and official numbers of new lake vessels has the following: Steam—Sir William Fairbairn, Detroit, 4,219.74 tons gross, 3,181.95 net, No. 116,736; Superior, Benton Harbor, 70.93

was 29½ miles, or 1½ miles more than they give us credit for. On the 29½ mile basis our speed per hour was 18.6 miles. With a boat making her first run on July 4, then laying up for three weeks, and going into a race on Aug. 13, we think the performance very creditable. The Enquirer could have done a great deal better in a time race."

Capt. Todd of the Say When does not answer the inquiry so clearly. He agrees with the officers of the Enquirer that the course was full 29 miles, on account of the start being at a point north and east of Fairport piers. The mean draft of the Say When, he says, was 6 feet 4 inches. He gives dimensions of cylinders somewhat different to those published, taking the figures, he says, from measurements made recently by the engineer. The dimensions he gives are: High pressure, 11½ inches; intermediate, 16½ inches; first low pressure, 22½ inches; second low pressure, 22½ inches; third low pressure, 22½ inches; stroke, 15 inches. The greatest pressure of steam carried at any one time, he says, was 230 pounds.

New Battleships and Torpedo Boats.

It is more than probable that the Cramps of Philadelphia, the Newport News Ship Building and Dry Dock Co., and the Union Iron Works Co. of San Francisco will each build one of the 11,000-ton battleships, for which appropriations were made by the last congress, and which are to be among the finest in the world. Bids



THE COMANCHE—ONE OF THE OLD TYPE OF ERICSSON MONITORS NOW IN ORDINARY AT SAN FRANCISCO.

tons gross, 48.23 net, No. 116,737. Sail—Alfred Krupp, Chicago, 3,259.43 tons gross, 3,124.70 net, No. 107,242; Geo. H. Corliss, Chicago, 3,259.43 tons gross, 3,124.70 net, No. 86,363.

Mr. John F. Pankhurst, general manager of the Globe Iron Works Co., says that no more vessels will be put down in the Globe yard on builders' account. He says that in view of their past experience with work of this kind, which was planned to keep ship yard forces together, it would be especially hazardous under present conditions to build any more vessels without contracts for them. All stocks are now empty in the Globe yard.

Still Discussing the Yacht Race.

In a communication discussing the Enquirer—Say When steam yacht race, in the Review of August 27, Wm. A. Fairburn, naval architect of Bath, Me., suggested a desire to obtain from owners of these yachts a correct statement as to their draft and also the horse power developed during the race. Capt. Samuel Golden and Engineer Wm. Skelton, Jr., answer this inquiry as follows, in a letter to the Review:

"The horse power developed by the Enquirer in her race with the Say When was 634 and the revolutions 356. Now as you have correct dimensions of the hull, engines and boiler, we do not think it necessary to say anything more along this line, but as we notice that Fred A. Ballin, superintendent of the Detroit Boat Works, and others have claimed that the distance covered in the race was only 28 miles, we can not allow such statements to pass without correction. A direct line overland from Fairport piers to the Cleveland club house is 28½ miles, and the course we took was from a whaleback barge lying about 1½ miles to the north and east of Fairport piers, so that in view of the course necessarily steered, the shortest we can make the run

which were opened on Monday last, were as follows: Newport News Ship Building & Dry Dock Co., one ship for \$2,595,000; John H. Dialogue & Son of Camden, N. J., one ship for \$2,661,000; Bath Iron Works of Maine, one ship for \$2,680,000; William Cramp & Sons of Philadelphia, one ship for \$2,650,000, and two for \$2,650,000 each; Union Iron Works of San Francisco, one ship for \$2,674,950. Thus the three lowest bidders are in order the Newport News company, Cramp & Sons and the Union Iron Works, the latter company being allowed a margin of 4 per cent above the lowest eastern bid to offset the difference in prices between the Atlantic and Pacific coasts. The department, under act of congress, must award the contracts for building these ships by Oct. 8 next, and the vessels themselves must be completed within three years thereafter. The limit of cost fixed for each ship was \$3,750,000, including the hull armor. It is estimated that this armor can be supplied by the department for less than \$1,000,000.

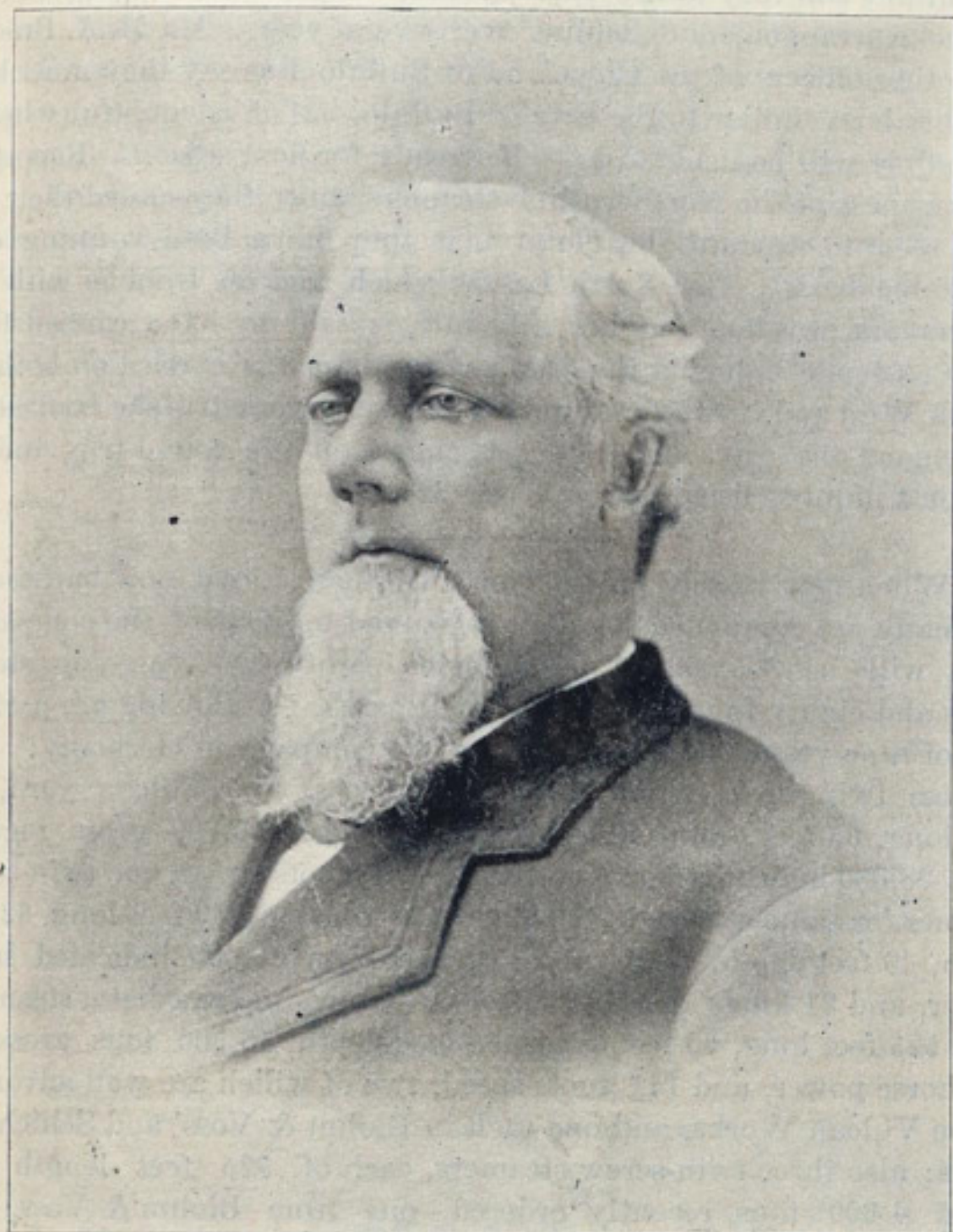
On Friday, the 18th inst., bids will be opened for thirteen torpedo boats, three of which are to have a speed of 30 knots. These three fast boats are to cost, together, not more than \$800,000, while there is an appropriation of \$500,000, or an average of \$50,000 each, for the ten slower vessels. Specifications for all of the torpedo boats, as well as the battleships, have been printed in previous issues of the Review.

For some time past we have found difficulty in obtaining good photographs of lake vessels when needed in the Review. We know that owners have also met with the same trouble. We have a photographer now engaged exclusively on this work. Order photographs from the Marine Review, 409 Perry-Payne building, Cleveland.

The new Goodrich steamer Iowa is to be fitted with the Globe steerer that was on exhibition at the World's Fair.

Pioneer of Lake Vessel Owners.

H. J. Webb of the firm of H. J. Webb & Co., vessel and insurance agents, who died at his home in Cleveland, Tuesday, was the first vessel broker on the lakes. He originated a business that is now followed on a broad scale by large concerns in all of the principal lake cities. The story of his early life in this connection is interesting. He was a young man engaged in a dry goods store in Cleveland in the early fifties. Pratt & Apley, a firm dealing in stone, had large contracts for structural material to be delivered at Buffalo. They em-



H. J. WEBB, FIRST VESSEL BROKER ON THE LAKES.

ployed Mr. Webb to engage vessels and look after their shipments of stone and other material. While thus employed he met other business men who had material to move by water, and many vessel captains, who in those days managed everything pertaining to their ships. He concluded that a vessel brokerage office, if rightly handled, could be made of such use to shippers and vessel owners that it would return a profit. He accordingly decided to open an office in Cleveland and did so in 1856. He was on the river, with others who came into the business later on, until 1873, when a general growth of trade caused all of the leading concerns to move to larger office buildings in the central part of the city. Since that time he has been known in all parts of the lakes as one of the shrewdest of the vessel brokers. Capt. W. C. Richardson, who has for two years or more managed entirely the business of the firm, and who is still in charge of it, joined him about fifteen years ago.

Mr. Webb made a couple of fortunes in the vessel business. He met with reverses but proved himself capable of overcoming business difficulties that might have weighed harder on other shoulders. Unfortunately he was taken sick—with Bright's disease, it was understood—just following a period of prosperity, when he might have enjoyed the results of a life of more than forty hard years spent in one line of industry. He was sixty-four years of age. Potsdam, St. Lawrence Co., New York, was his birthplace. He was a diplomatist among vessel men, but possessed also a companionable, whole-souled disposition. Resolutions of respect to his memory were adopted by vessel owners of Detroit, Cleveland and other lake cities.

Capt. Allen M. Kirby, one of the lake captains of early days, died at Wyandotte on Saturday last. Of late years he has been connected with the ship yard of the Detroit Dry Dock Co. at Wyandotte. He was an uncle of Frank E. Kirby. His first sailing on the lakes was on vessels trading out of Oswego, as early as 1840. He was seventy-four years of age.

After Old Wrecks.

Some of the smaller wrecking concerns on the lakes have spent several thousand dollars during the past season trying to release stranded or sunken vessels that have been almost entirely given up by the underwriters. There is always a temptation among tug owners who have a few wrecking appliances to engage in work of this kind, although their efforts are seldom rewarded by even a moderate profit. Capt. James Reid is not alone in his failure with the Cayuga. Murphy of Detroit has spent the greater part of the summer endeavoring to raise the schooner Adams, sunk in Lake Erie, near the mouth of the Detroit river, and it was thought that he was already to lift the boat when the announcement was made that he had abandoned her on account of bad weather coming on.

Another wreck on which \$4,000 or \$5,000 has been spent, during the past season, is that of the schooner Mattie C. Bell, ashore on Summer island. The tug Albert Wright and schooner L. B. Shepard from Sturgeon Bay spent seventy-two days without success on this wreck. They were assisted at times in pulling on the boat by the steamer Joseph L. Hurd. The Bell lies in the bay on the east side of Summer island, heading about S. by E., starboard side to the beach, and rests upon a rocky bottom about 200 feet from shore in 9 and 11 feet of water, the former being on the starboard side and the latter on the port side. About 100 tons of coal was lightered from the stranded schooner to the Shepard and several unavailing efforts made to pump her out and pull her off. This failing, eight hydraulic jacks, two 100 tons each and six 60 tons each, were placed near her knuckle on the port side which heeled her over to the starboard. A diver then went down and pulled all the loose boulders out of her bottom, after which a canvass jacket was put on. The vessel's main and mizzen and staysails were used for this purpose, besides several thousand feet of lumber which was nailed on over the canvas. Four steam pumps succeeded in lowering the water in her hold down to 2 feet from 9 feet, and she was then given another pull. She was heeled over a second time with the jacks and raised about 5 feet, and eleven stone butments built under her, most of the stone being picked up from the bottom of the lake in proximity to the wreck. Some of the larger stones the diver had to roll along the bottom for a distance of 50 feet. The wreck worked off this underpinning partly by being pulled around by the tug, and partly by the action of the waves, as she lies exposed to easterly winds. During all this time the Bell was not moved ahead or astern, her bottom amidships being punctured by a cluster of boulders that held her in position, and she worked around as though on a pivot. It was almost an impossibility to get at the leak from the hold, as she has three floors; the first a false one, running athwartships and the other two fore-and-aft, it being about three feet from the first floor to her ceiling. The 100 tons of coal taken out of the wreck and put into the Shepard was afterwards used for fuel by the tugs. In leaving the boat the wreckers took with them everything they could release, including two anchors, one 2,200 pounds and the other 1,700 pounds, 120 fathoms of cable, yawl, light spars, steering gear, windlasses, etc.

Harvey D. Goulder of Cleveland, representing a large number of vessels that have thus far been fined for violating Sault river regulations, met officials of the treasury department in Washington on Saturday last, and it is understood that, as a result of the conference, only nominal sums, probably about \$10 each, will be demanded in settlements to be made immediately with owners, excepting where it appears that there has been wilful and persistent violation. Vessel masters fined in future need not, however, expect such lenient treatment as has been accorded in these cases, as it is now fully understood that the rules are to be enforced rigidly for the balance of the season.

Since May 1 there has been a decline in the weekly rate of pig iron production from 189,400 tons per week to 130,500 tons per week on Sept. 1. The high water mark was reached on Nov. 1, with a weekly product of 217,300 tons. Although there has been some addition to stocks in August, the production has now fallen off so heavily that it must be within even the present light demand.

At Buffalo a few days ago Hingston & Woods secured a Niagara river dredging contract involving about \$50,000 worth of work. Their bid was \$76 a day for drill boat, \$74 for dredge and \$18 for tug. Another contract let in Detroit was for \$4,500 worth of dredging, to be done at St. Clair, Mich. Carlin & Stickney of Detroit secured this work at 8½ cents per cubic yard.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,
by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient
binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1895, contained the names of the 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1895, was 360 and their aggregate gross tonnage 643,260.40; the number of vessels of this class owned in all other parts of the country on the same date was 309 and their tonnage 652,598.72, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,755	857,735.13
Sailing vessels	1,100	300,642.10
Unrigged.....	487	83,081.91
Total	3,342	1,241,459.14

The gross registered tonnage of the vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
Total	347	335,433.98

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages.....	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered.....	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation.....	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about $\frac{1}{4}$ per cent. of the whole, but largely in American vessels.

Dispatches from New York announce that Charlton T. Lewis has sailed for London to sell the franchise of the Erie Canal Traction Co. to an English syndicate for \$3,000,000. The scheme of this company and the Cataract General Electric Co., of which it is a part, to use electricity for moving boats on the Erie canal is worthless, especially when viewed in connection with the claim that canal boats can be loaded with grain or other freight at Chicago or Duluth and taken to New York without breaking bulk. It is not at all probable that capitalists in this country or in England will be taken in by any such claims as those made recently in the New York papers regarding this company. There has all along been a suspicion of stock jobbing methods in connection with this franchise. To begin with, everybody who is at all acquainted with electricity understands the big problem that would be involved in transmitting power along the Erie canal for a length of more than 300 miles, and it is well known also that even though the canal might be fully equipped with electricity, vessels would be at the mercy of steam power on the Hudson from Albany to New York. But the most absurd and visionary parts of the plans upon which it is proposed to sell, at a big price, this franchise, which was obtained for nothing, are the details regarding the lake end of the route. Think of towing, or moving in any way, steel canal boats, even of the kind that can navigate the enlarged Erie canal, from Buffalo to Duluth and Chicago! It is well known that the Cleveland Steel Canal Boat Co., with its short stretch of lake navigation between Cleveland and Buffalo, has never been able to make better than 5 miles an hour with a tow assisted by a tug. But placing aside all reference to the impracticability of operating canal boats on long lake routes, the question of freight charges is an absolute bar to such a scheme as that talked of in the New York dispatches. Grain is being carried to-day from Chicago to Buffalo in lake steamers at 3 cents a hundred. This is a lower rate than the Cleveland Steel Canal Boat Co. or the Cleveland and Buffalo Transit Co. would accept on freight from Cleveland to Buffalo. The present canal rate, Buffalo to New York, is only 6 $\frac{1}{4}$ cents a hundred, including trimming at Buffalo, elevation at New York and insurance. This would be nothing more than a living rate for canal boats, even with the enlargement of the Erie that is under way. It would be interesting, therefore, to learn how canal boats are to come onto the lakes and compete, under these circumstances, for through business to New York with 4,000-ton lake ships and the present system of transferring

freight at Buffalo. Englishmen will probably investigate this matter before they pay \$3,000,000 for the Erie Canal Traction Co.'s franchise.

Success attending the operation of some of the best passenger ships on the lakes during the past season may result in a contract or two being offered to the ship builders during the dull period that is now at hand. The new side-wheel steamer City of Buffalo will clear for her owners full \$40,000 during the present season. This is a very good return on an investment of about \$340,000, especially as the City of Buffalo, contrary to the usual custom, was not built on cash but on a financial arrangement extending over several years. Mr. M. A. Bradley and other officers of the Cleveland & Buffalo line say they must have another boat similar to the City of Buffalo, but it is doubtful whether any effort will be made to have her ready for next season. Reports of the business of the Northern line steamers, since they closed their season, seem to warrant the claim that they have been running on a profitable basis. The North Land, which had no trouble with her boilers and was kept on her schedule, is said to have carried 1,600 more passengers during the past season than was carried on both the North West and North Land during 1895. On one trip she booked 800 passengers one way, and 1,400 passengers on the round trip, and the smallest number listed one way was 324.

When new vessels for the North German Lloyd now building in Germany are completed the total registered tonnage of the company's fleet will be 305,000. This includes eighty-two sea-going steamships and eighty-four tenders and small craft. Following are particulars of nine vessels now building for this company in Germany: One express twin-screw Atlantic mail steamer at the Vulcan yard, 625 feet long, 65 feet beam, 40 feet moulded depth, 13,700 gross register tons, 28,000 indicated horse power, and 21 knots speed; one twin-screw steamer for same service in Schichau's of Danzig, 580 feet long, 62 feet beam, 40 feet depth, 12,200 gross register tons, 24,000 indicated horse power, and 21 knots speed; four twin-screw intermediate steamers, each 525 feet long, 60 feet beam, 38 feet depth, 10,500 tons gross, 7,000 horse power, and 14 $\frac{1}{2}$ knots speed, two of which are well advanced at the Vulcan Works, and one each in Blohm & Voss' and Schichau's yards; also three twin-screw steamers, each of 325 feet length and about 4,500 tons, recently ordered—one from Blohm & Voss, one from Tecklenborg, and one from the Seebeck company.

The attitude of the new Canadian government with regard to the four 20-knot mail steamships that were to be built for service between the Dominion and the mother country is somewhat puzzling. The Canadian parliament, under the old government, voted a subsidy of \$750,000 a year for the new service and this was to be supplemented by \$375,000 annually from the imperial government. Before the old government relinquished control, proposals for the service had been called for, and the Messrs. Allan, owners of the Allan line of steamers were the lowest bidders. The matter had not been passed upon by parliament, however, and it is now rumored that the new government will overthrow all previous arrangements. There is nothing definite on this score, however, as the present session of parliament was called simply to pass upon the government estimates, and the policy of the new administration with reference to this steamboat service may not be known until the next session.

Statistics prepared by the United States Geological survey show that the iron ore product of Lake Superior mines in the year 1895—nine and a half million tons—was the double maximum annual output of the noted Bilbao district of Spain and one-half greater than the largest amount credited to the Cleveland district in England in any one year; and the average quality of the ores obtained from the Lake Superior mines is not equaled by any other large producing district.

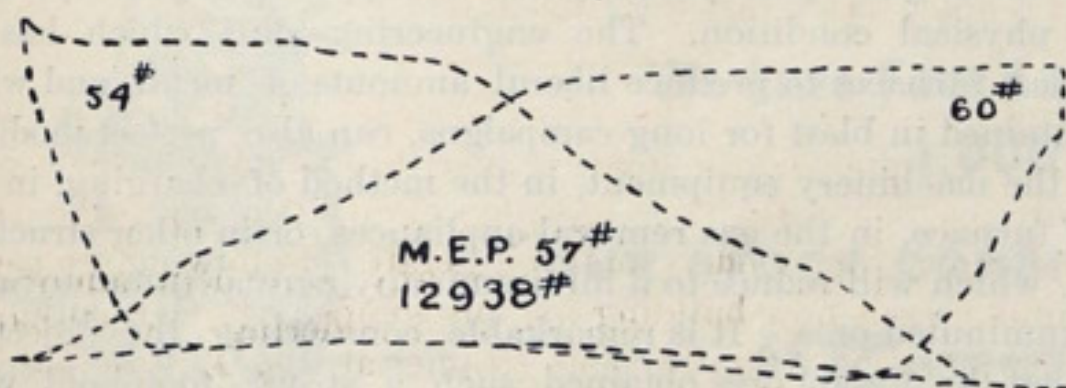
Ensign Cole, U. S. N., whose transfer from the branch hydrographic office, Cleveland, was announced a week ago, has received a change of orders. He will not go to the Raleigh, but to the dispatch boat Dolphin, which has often been referred to as the private yacht of the secretary of the navy. Mr. Cole will be succeeded by Lieut. Stafford.

Order photographs of vessels, best quality, to be taken on Detroit river, from the Marine Review.

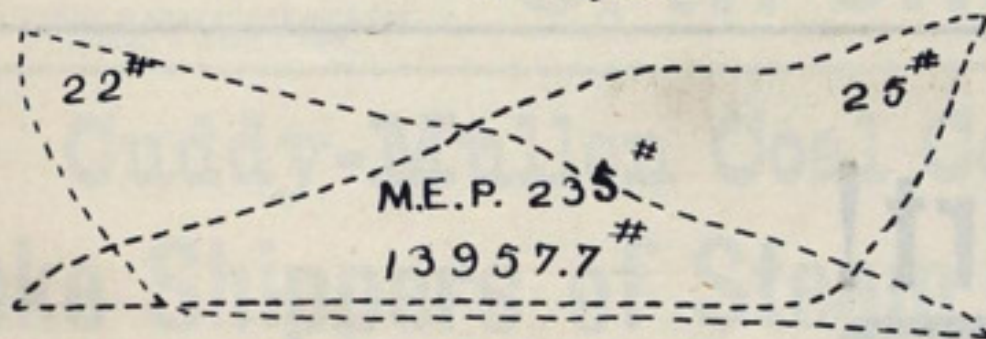
Light Fuel Consumption on the Aragon.

Officials of the Dry Dock Engine Works, Detroit, as well as the Cleveland owners of the new freight steamer Aragon, are undoubtedly very much pleased with the results of an engineering test made on that steamer recently, while bound down the lakes with a cargo of grain. The fuel consumption during eight hours, at 11.3 miles speed, was only 1.63 pounds per hour. This is a better showing than has previously been made in the several scientific trials of lake steamers conducted by experts. The Detroit builders are especially pleased with it on account of the Aragon being fitted with Howden hot draft appliances. They claim also that the test is what might be termed a commercial test, as the ship was boarded at Detroit after having made a long run from the head of Lake Superior. Nothing was done in the way of cleaning up or preparing for the trial. It thus shows, they say, what the boat is doing in actual service, the intention being to secure data regarding the engines that might be depended upon in the building of other engines of about the same kind. The boat is a very full model, as she was built to carry the limit of cargo on dimensions of Welland canal locks. Her bottom and bilges are sheathed with oak and this is also a partial drawback as regards speed.

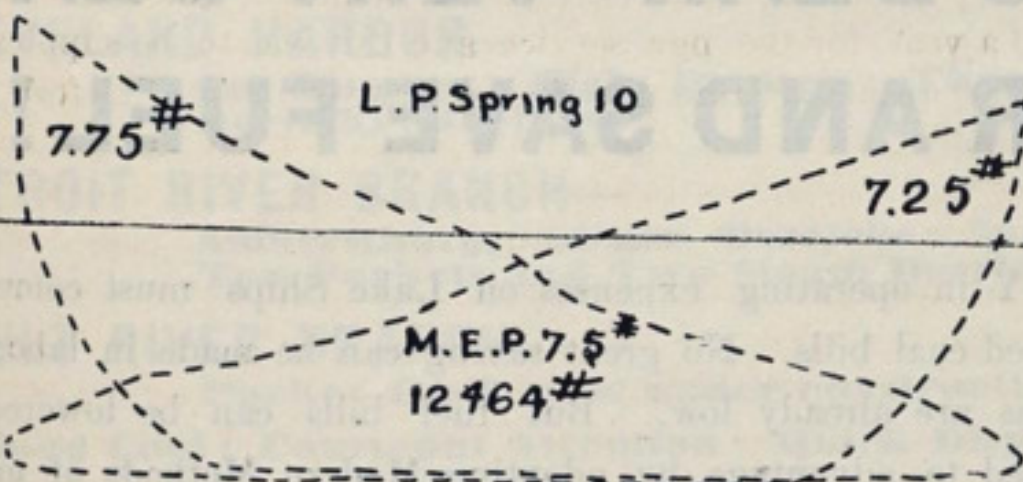
H. P. Spring 80



Int. Spring 40

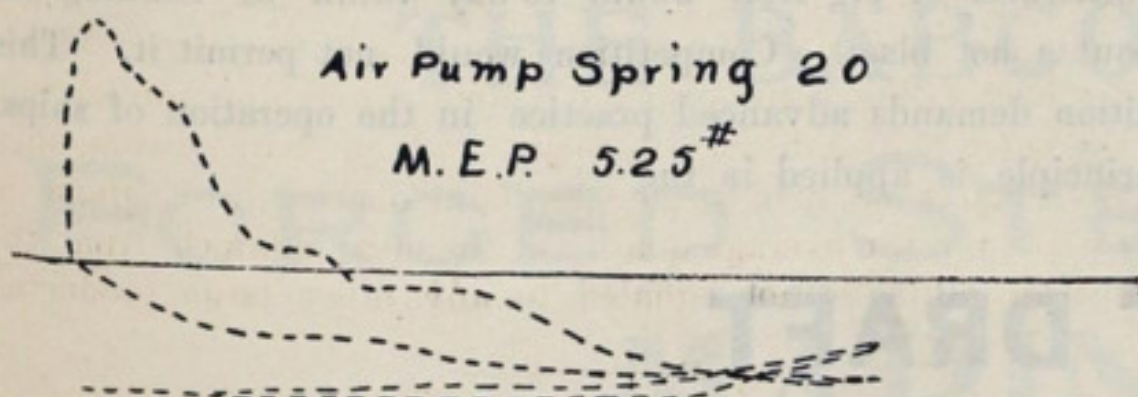


L. P. Spring 10



Air Pump Spring 20

M. E. P. 5.25#

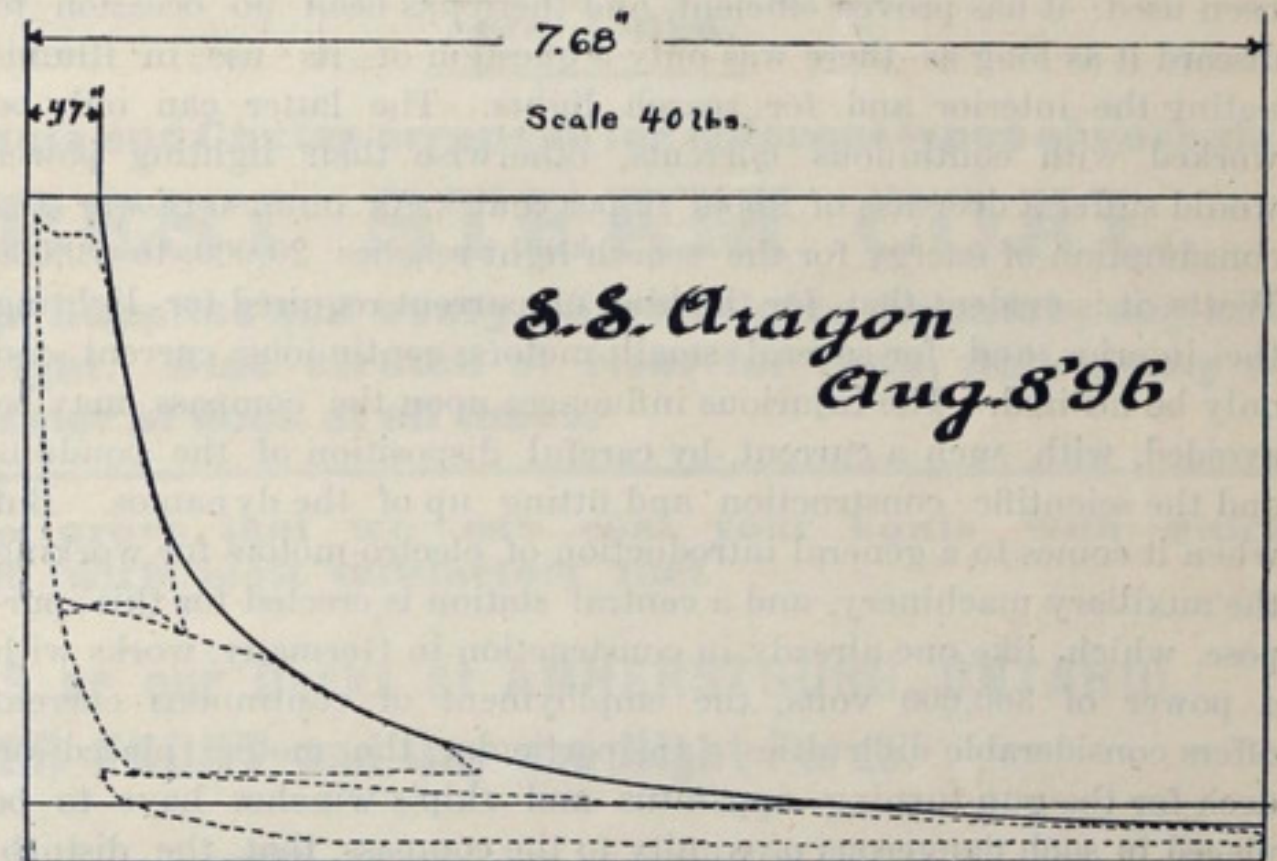


Boiler pressure	150 pounds.
Vacuum	22 inches.
Revolutions	91
I. H. P., high pressure	214
I. H. P., intermediate	230.9
I. H. P., low pressure	206.2
Total I. H. P.	651
M. E. P., referred to L. P.	23.68

TRIAL OF STEEL FREIGHT STEAMER ARAGON.

Engine—triple expansion with cylinders 17, 27½ and 46 inches by 36 inches stroke. Air pump 24 inches diameter by 12 inches stroke, with 12 inches diameter trunk.

Boiler—One of cylindrical type, 12 feet 6 inches diameter by 11 feet 6 inches long, allowed 162 pounds working pressure. Furnaces 44 inches diameter; 5 feet 6 inches grate bars; 40 1-3 square feet grate surface. Total heating surface, 1,926 square feet. Ratio of heating surface to grate surface, 47.7.



Fan—Wheel of 50 inches diameter and 25 feet width. Fan engine, vertical, 6 inches by 6 inches.

Heater—14 inches diameter by 7 feet long over all.

Propeller—Cast iron, four blades, 10 feet 10 inches diameter, 12 feet 6 inches pitch; 40.36 square feet projected area.

Load, net tons	2,500
Draught, feet and inches	14-7
Steam pressure, pounds	150
I. P. receiver pressure, pounds	46
L. P. receiver pressure, pounds	4½
Vacuum, inches	22
Indicated horse power, H. P.	214
Indicated horse power, I. P.	230.9
Indicated horse power, L. P.	206.1
Indicated horse power, total	651
Indicated horse power, air pump	6.58
Per cent. air pump of total	.01
Revolutions, main engine	91
Revolutions, fan engine	185
Air pressure inches	2
Ratio of horse power to grate surface	16
Ratio of heating surface to horse power	3
Duration of trial, hours, minutes	7-40
Total coal burned, pounds	8,156
Coal burned per hour, pounds	1,064
Coal burned per I. H. P. per hour, pounds	1.63
Speed of boat, miles	11.3
Speed of propeller, miles	12.9
Slip of propeller, per cent.	12.5
Temperature of hot well, degrees	130
Temperature of heater, degrees	160

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Sept. 12, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago	13,188,000	4,366,000
Duluth	5,864,000	52,000
Milwaukee	396,000	3,000
Detroit	466,000	14,000
Toledo	717,000	52,000
Buffalo	1,392,000	380,000
Total	22,023,000	4,867,000

As compared with a week ago, the above figures show at the several points named an increase of 350,000 bushels of wheat, and a decrease of 576,000 bushels of corn.

Electricity on Board Ships.

At the last meeting of the Society of Naval Architects a paper on the "Use of Electricity on Board Ships" was presented by Herr F. Eickenradt. In concluding a long discussion of the advantage of the electric motor and the various uses to which it may be applied on board ships, the author of this paper says:

"With the increasing employment of electricity on ships, the question arises whether continuous or alternating currents should be chosen. In installations hitherto made the continuous current has been used; it has proved efficient, and there has been no occasion to discard it as long as there was only a question of its use in illuminating the interior and for search lights. The latter can only be worked with continuous currents, otherwise their lighting power would suffer a decrease of about 40 per cent. As on men-of-war the consumption of energy for the search-light reaches 20,000 to 70,000 Watts, it is evident that, for the kind of current required for lighting the interior, and for several small motors, continuous current can only be utilized. The injurious influences upon the compass may be avoided, with such a current, by careful disposition of the conduits and the scientific construction and fitting up of the dynamos. But when it comes to a general introduction of electro-motors for working the auxiliary machinery, and a central station is erected for this purpose, which, like one already in construction in Germany, works with a power of 300,000 volts, the employment of continuous current offers considerable difficulties. In particular, the motors placed on deck for the gun-turning apparatus and ship's winches have to be placed in such dangerous proximity to the compass, that the disturbing of the latter, in case of parallel current, can hardly be prevented. For the working of this machinery the use of the alternating current becomes unavoidable, as such a current, and motors driven by it, has no influence upon the compass. This necessitates the erection of two central stations, viz., one for the search-lights and the lighting, with parallel current, and a second station, with alternating current, for driving auxiliary machinery. Unfortunately this entails the disadvantage that the motors for one station cannot be employed in

support of, and in substitution for, those of the other, and great complication would be created demanding greater capabilities from the crew. It will be impossible to avoid this if the increased advantage which the use of electrical appliances affords on board ship are to be secured."

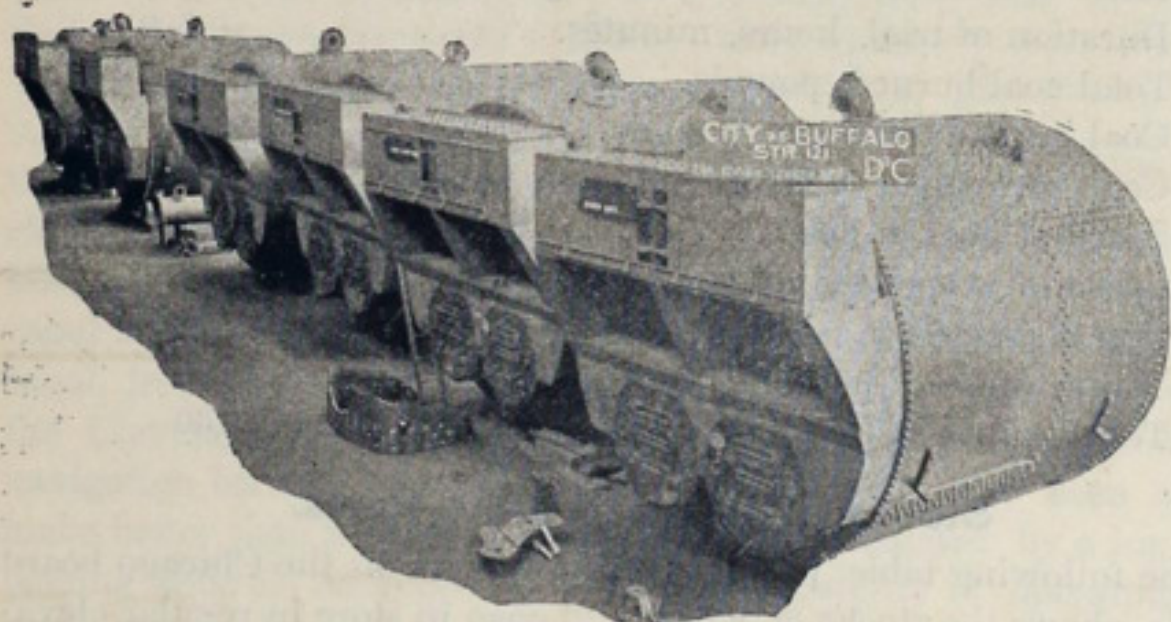
Physical Condition of Mesabi Ores.

In his latest report to the United States Geological Survey on "Iron Ores of the United States," John Birkinbine of Philadelphia says of ores from the Mesabi range, Minnesota:

"The objection of the physical condition of some Mesabi ores may be considered merely as of temporary character, and the statement that blast furnace managers can not use finely comminuted ores is a reflection upon the ability of men who have accomplished greater results than that of adapting their plants and their practice to the use of a deposit of such magnitude and character as has been developed on the Mesabi range. Men who have mastered the problem of producing pig iron within the narrow limits of chemical constituents acceptable to consumers, and who have reduced fuel consumption to a point approaching theoretical possibility, will find means to use liberally ore of good quality which can be supplied in quantity, whatever its physical condition. The engineering skill which has designed blast furnaces to produce liberal amounts of metal, and which are maintained in blast for long campaigns, can also perfect modifications in the machinery equipment, in the method of charging, in the shape of furnace, in the gas removal appliances, or in other structural features, which will reduce to a minimum any permanent annoyances from comminuted ores. It is remarkable, considering the objections raised, that the Mesabi ores obtained such a strong foothold when their introduction was largely at a time when furnace proprietors were expending little or nothing in improvements and managers were not encouraged in experiments, but it is questionable whether this introduction was not, as a rule, at prices which left no profit for producers."

Air is Cheap—Cheaper than Dirt!

FUEL IS DEAR—VERY DEAR! USE AIR AND SAVE FUEL!



Six Boilers with Howden Hot Draft appliances now in Side-Wheel Steamer City of Buffalo. Dimensions of each boiler—12 ft. 6 in. diameter by 12 ft. length.

ECONOMY in operating expenses on Lake Ships must come from reduced coal bills. No great saving can be made in labor cost, and provisions are already low. But fuel bills can be lowered and cheap coal used to advantage by adopting Modern Methods of making steam at low cost.

No manufacturer of pig iron would to-day think of running his furnace without a hot blast. Competition would not permit it. This same competition demands advanced practice in the operation of ships. The same principle is applied in the

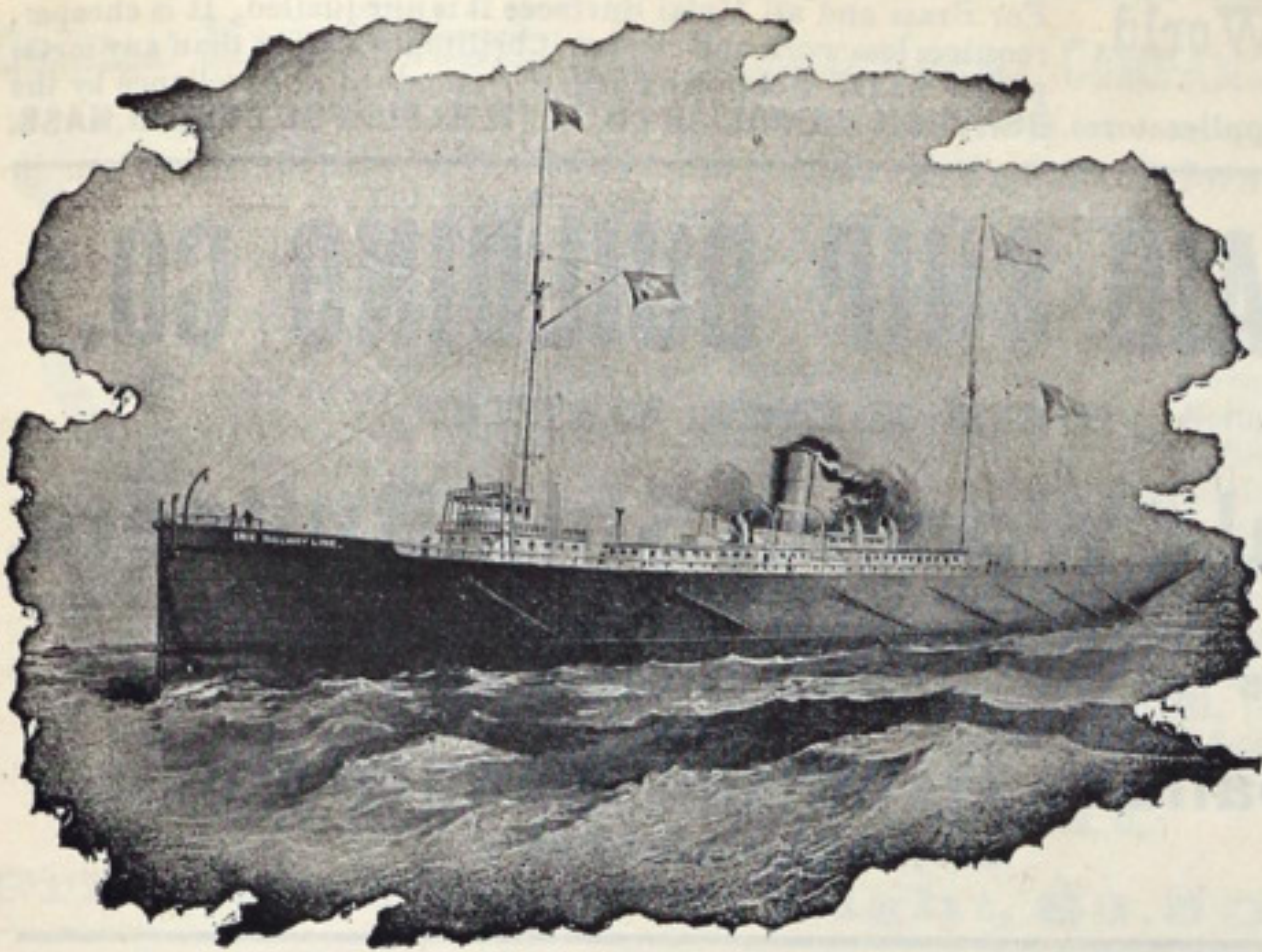
HOWDEN HOT DRAFT

Now in use on Lake Steamers aggregating over 40,000 Horse Power.

CAN BE APPLIED TO OLD SHIPS AS WELL AS NEW ONES.

No complicated machinery. Cool engine rooms and cool fire holds. Estimates readily furnished for application of this draft to any steamer

DRY DOCK ENGINE WORKS, DETROIT, MICH.



Rapid Fueling Docks, DETROIT RIVER.

JAMES GRAHAM, Foot Twenty-first St., Detroit,
Below Routes of Passenger and Car
Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

BEST STEAM COAL.

Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.



Keeping a sharp look-out for
Shipman's Coal Dock.

GIVE US a chance to prove that we can coal your boats with quick dispatch, and with most satisfactory fuel.

We have Four Large CHUTES on our Docks at AMHERSTBURG, ONTARIO,
1,000 FEET RIVER FRONT and Day and Night Force.

OUR STOCK CONSISTS OF

**"Keystone" Massillon, Youghiogheny,
and Best Grades of Hocking Koals.**

O. W. SHIPMAN, MAIN OFFICE,
90 Griswold St., Detroit, Mich.

Cuddy-Mullen Coal Co. Lake Shippers of Steam Coal.

FUELING DEPARTMENT FACILITIES:

CLEVELAND HARBOR—

Car Dumper; Eight Pockets; Three Steam
Derricks; Lighter.

DETROIT RIVER BRANCH—

Amherstburg, Steam Derricks; Sandwich,
Ten Pockets and Two Steam Derricks.

SAULT RIVER BRANCH—

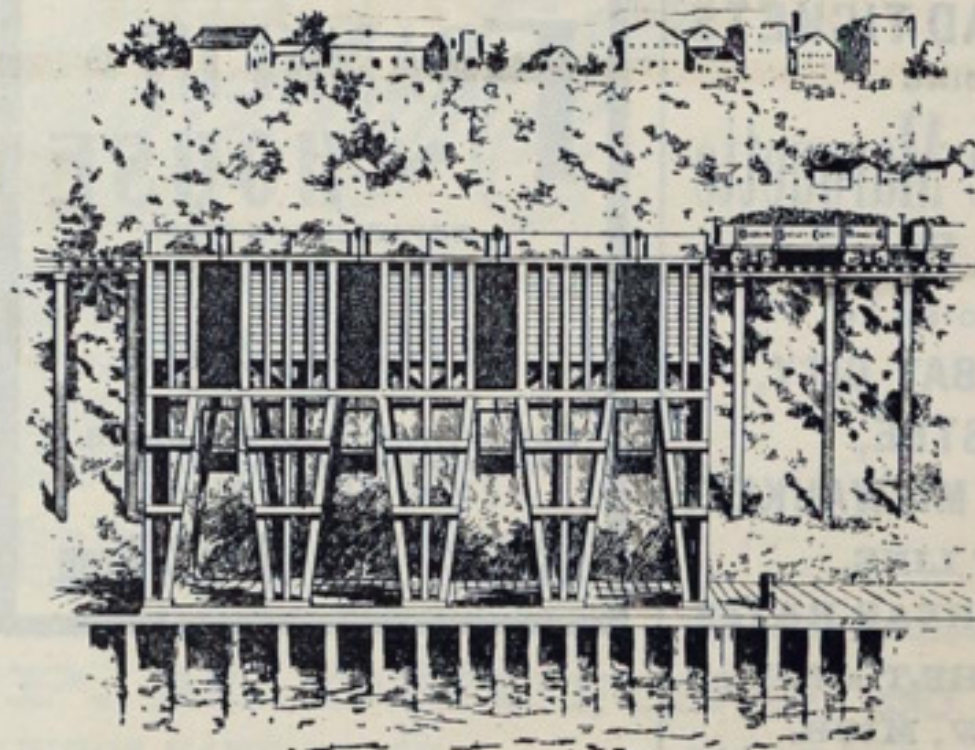
Pocket Dock now under construction.

Good Coal; Courteous Attention; Quick Dispatch.

General Offices: Perry-Payne Bldg., Cleveland, O.

FUEL DOCKS OF OSBORNE, SAEGER & CO.

Cuyahoga River, just above Superior St. Viaduct, Cleveland, O.



Best
Youghiogheny
Steam Coal
Furnished
Day or Night.
No delay as
Elevated
Pockets
are used.

THE BABCOCK & WILCOX CO. FORGED STEEL WATER-TUBE MARINE BOILER,

29 CORTLANDT ST., NEW YORK.

Boilers sold to United States Merchant Marine and Yachts - - - - - 16,500 H. P.

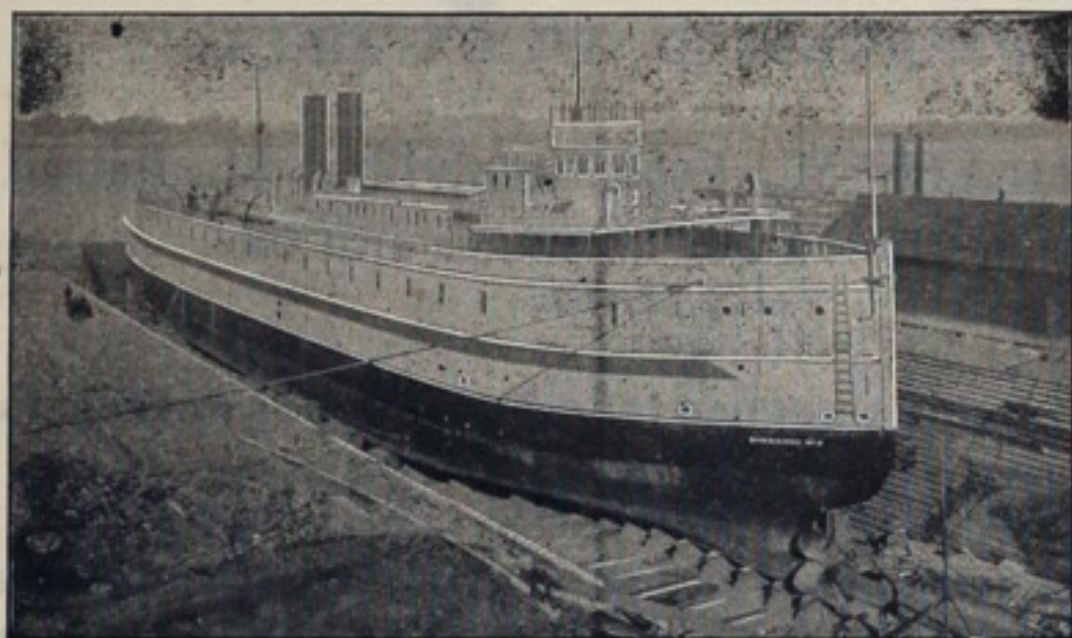
Boilers sold to United States Navy - - - - - 7,500 "

The only Water-tube Boiler in the British Merchant Marine 15,500 "

Bertram's Oil Polish, The Marine Polish of the World.

U.S. government in the marine departments. For sale by ship chandlers and engineers supplies stores.

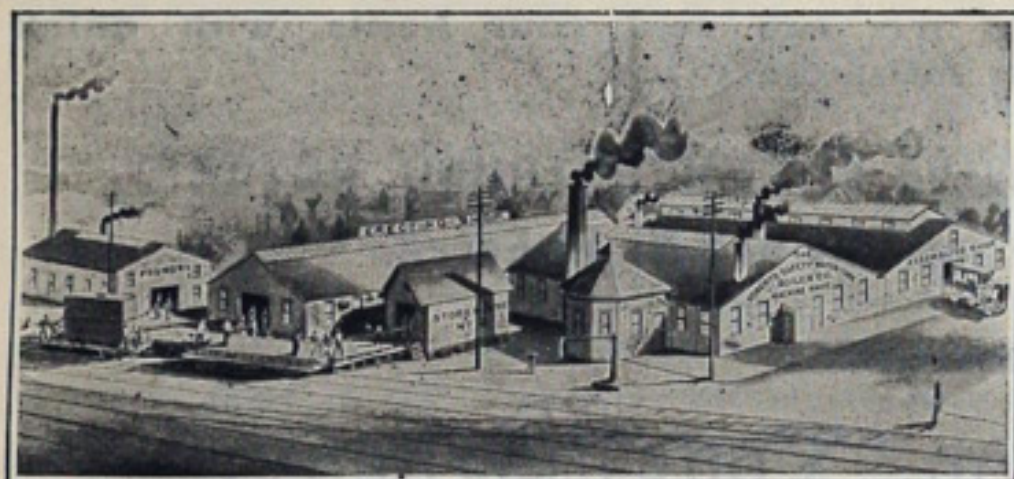
For Brass and all Metal Surfaces it is unequalled. It is cheaper, requires less work and retains its brilliancy longer than any metal polish made. Acknowledged the standard of excellence by the BERTRAM OIL POLISH CO., 220 & 22 State St., BOSTON, MASS.



Shenango No. 2, 300 feet long, 54 feet beam.

CRAIG SHIP BUILDING CO.

TOLEDO, OHIO,

Metal & Wooden Ship Builders.New Dry Dock—450 feet long, 110 feet wide on top,
55 feet wide on bottom, 16 feet of Water on Sill.**Repairs to Metal and Wooden Ships
A Specialty.**Office of
AMERICAN
STEEL BARGE
CO.West Superior
Wis.,
Oct. 31, 1895.The Roberts
Safety Water
Tube Boiler Co.,
39 and 41 Cort-
landt St., New
YorkGentlemen:
Replying to
your of the
28th I am glad
to say that the boiler you furnished us for tug "ISLAY" is giving entire satisfac-
tion. I have heard no complaint about it whatever, but have heard a good deal in its
favor. I ride on the boat frequently and must say that I am much pleased with its
work. Very Truly yours,
Alexander McDougall, General Manager.**THE ROBERTS BOILER is the Cheapest, Best and Lasts Longest**

Adapted for use in Yachts, Launches, and Vessels of all Kinds.

Handsome Illustrated Circular sent free on application to

The Roberts Safety Water Tube Boiler Co.,

WORKS, RED BANK, N. J.

39 & 41 Cortlandt St., NEW YORK

**STEAMBOAT CAPTAINS,
ENGINEERS, CREWS,****BUY RAILROAD TICKETS**

READING

**Flint & Pere Marquette
R. R.**

WHEN GOING TO

SAGINAW BAY CITY,**MANISTEE,****LUDINGTON, MILWAUKEE.****SHORT LINE,****CHEAP RATES.****A. PATRIARCHE, Traffic Mgr.****SAGINAW, MICH.**

FRANKLIN
HOUSE

ESTABLISHED 1837.

Cor. Bates and Larned Sts.,
DETROIT, MICH.

Only a Block from Woodward &
Jefferson Aves. Very Central.
Near All Car Lines.

Per Day, \$1.50. **H. H. JAMES, Prop.**

All reliable statistics relating to shipping are contained in the
Blue Book of American Shipping. Price, \$5. MARINE REVIEW,
Cleveland.

INCORPORATED 1794.

Insurance Company of North America.**CAPITAL, Paid up in Cash, . . . \$3,000,000.00**
ASSETS, 9,487,673.53

CHARLES PLATT, President.

EUGENE L. ELLISON, 2nd Vice-President.

JOHN H. ATWOOD, Assistant Secretary.

WILLIAM A. PLATT, Vice-President,

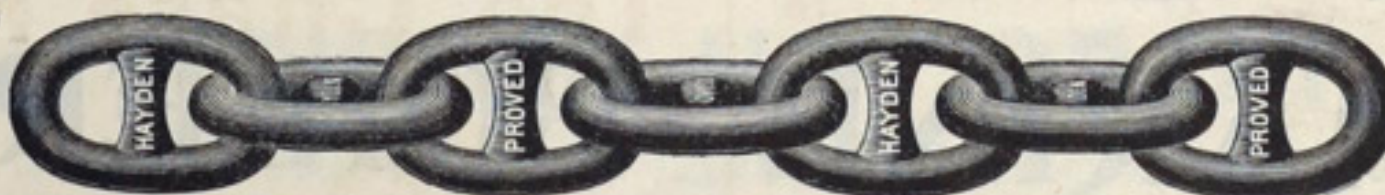
GREVILLE E. FRYER, Sec'y. & Treas.

Lake Marine Department.**GEORGE L. McCURDY, Manager.**
CHICAGO, ILLS.**Gas Engine & Power Co. and
Charles L. Seabury & Co.**

BUILDERS OF

The Only Naphtha Launch,**High Class Steam Yachts, Sail Yachts,
Electric Launches, Dinghys, Gigs and
Yacht Tenders.****Seabury's Water Tube Boilers and Marine Engines.****Storage Basin and Ship's Ways.****Overhauling of all kinds promptly done.****Charters and Insurance.****Boats bought and sold on commission.****Correspondence Solicited.**

Send ten cents in stamps for Catalogue to down town office,

50 Broadway, or to factory at Morris Heights, New York City.**Chain Department * P. HAYDEN S. H. CO. * Columbus, Ohio.**Our Chain in use on the Largest Steamers on
the Lakes:**The Zenith City, Victory,
North West and North Land,
and many others.****All kinds of Chain—
Stud and Close Link,
Cable Chains.****Write for Prices.****AMERICAN SHIP WINDLASS CO. P. O. BOX 53, PROVIDENCE, R. I.**

BUILDERS OF THE

"Providence" Windlasses and Capstans**350 STYLES AND SIZES.
OVER 5000 IN USE.****SEND FOR CATALOGUE.****FRANK S. MANTON, AGENT.**

GRAHAM-MEYER TORCH and LIQUID LIGHT COMPANY

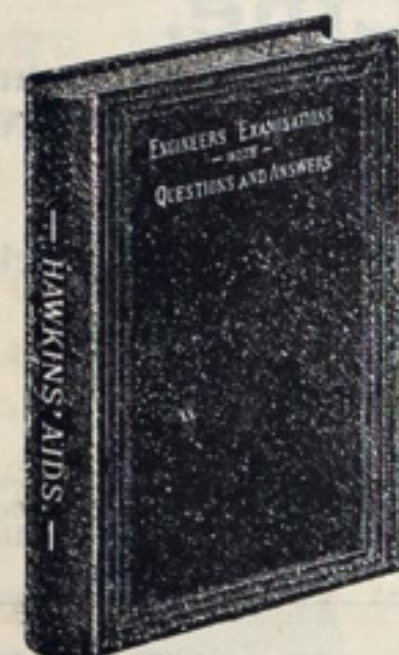
89 Fulton St., Boston, Mass.

MANUFACTURERS OF

**Torches and Liquids for Lights of Various Colors,
For Signal Lights and Illuminations of all kinds.
Blue Flash Lights a Specialty.**

We call the attention of masters of vessels to the efficiency of our patented flare-up or flash light torch. It can be used with kerosene or spirits of turpentine. Its superiority over all other kinds of torches is that it is indestructible. Being filled with asbestos, it will last for years, and is ready for use at any moment. It gives a white flame three to five feet high, burns less liquid than any ordinary torch of the same size or larger. The combustion is so perfect that very little smoke is made, and the flame is therefore much brighter. At night you can wigwag with this torch. Rain or spray will not extinguish it, and the stronger the wind the better it burns. We have also a **Blue, Green and Red Burning Liquid**, to make any code of signals required. Yachtsmen will find this of immense value for signaling.

Make Agents: { The Upson-Walton Co., Cleveland, O.
H. Channon Co., Chicago, Ill.

Price of Flare-up Light, \$3.50**"Engineers' Examinations"**

With Questions and Answers.

Printed on heavy paper and bound in red leather.

Any young engineer, greaser or fireman ought to have it.

Sent postpaid to any address, on receipt of \$2.00.

MARINE REVIEW,

410 Perry-Payne Bldg.,
Cleveland, O.

Artistic Photographs.

The REVIEW has a photographer, the best on the lakes, engaged in taking photographs of vessels passing through the Detroit River. Large pictures. No objectionable background. Let us have your order.

409 Perry Payne Bldg., Cleveland.

EVERY MARINE ENGINEER
on the Lakes, and every second
who is studying for first class
papers, ought to possess

Reed's Engineers' Hand Book

(Fifteenth Edition.)

Containing 600 engravings and a
portfolio of drawings of all parts
of marine engines.

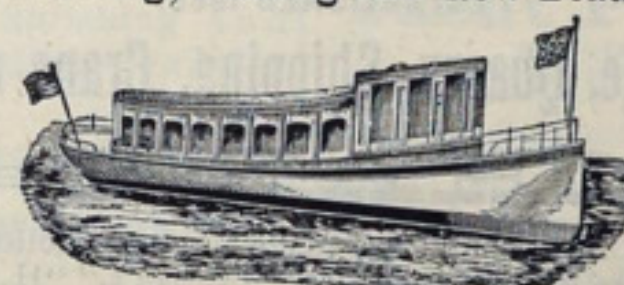
It has always sold for \$4.50 and
\$5. Until Oct. 1 any subscriber to
the REVIEW may have a copy
sent post paid by enclosing this
advertisement and \$4 to

Marine Review,

BOOK DEPT.

409 Perry-Payne Bldg., CLEVELAND, O.

VAPOR & STEAM LAUNCHES,
Hunting, Fishing and Row Boats.

**BOAT BUILDING MATERIALS**

for all kinds of boats cut and
bent to shape.

Address, **FRED MEDART,**
Catalog's FREE. ST. LOUIS, MO.

**COLUMBIA MFG. CO.**

Manufacturers of

METAL POLISH, * BUFFING COMPOSITIONS.

A great labor saver.
Especially adapted for Marine Engines.
1 lb. tin boxes, 45 cents; 5 lb. pails, \$1.50.

94 Holmden Ave., CLEVELAND, O.

John Thompson, 123 River St., Agent, Cleveland, O.



FUELING DOCKS:
NORTH PIER!
18th STREET BRIDGE,
ILLINOIS CENTRAL SLIP 'C'

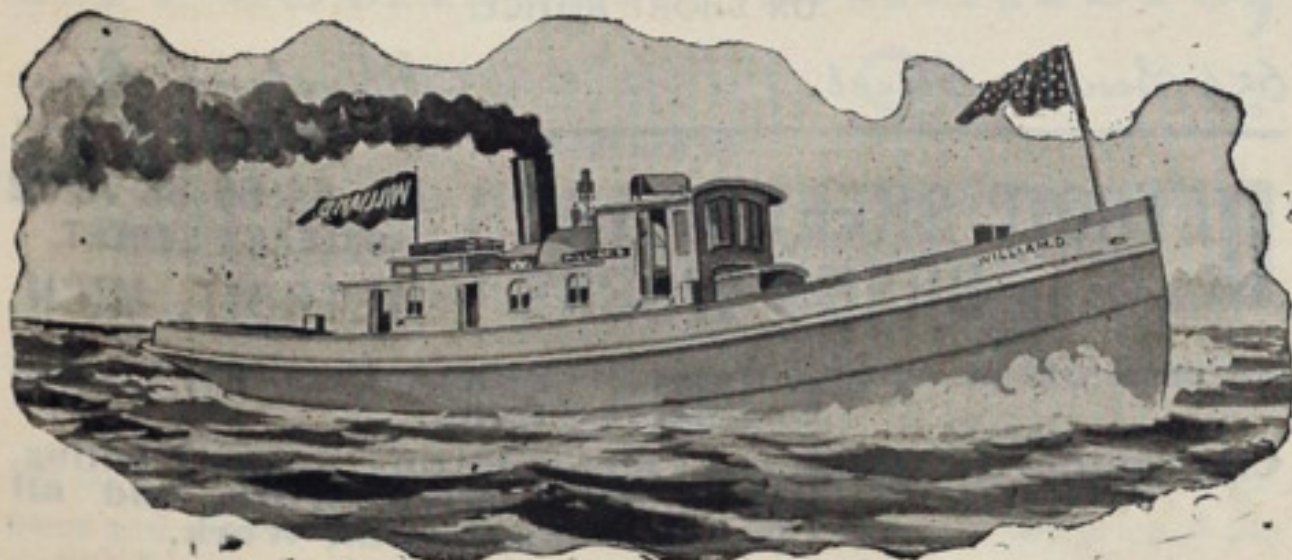
STORAGE DOCKS FOR ANTHRACITE:
KINGSBURY ST. BETWEEN INDIANA & ERIE STS.
ELSTON AVE. DIVISION ST. BRIDGE (NORTH BRANCH)
NORTH AVE. BRIDGE.
DIVISION ST. BRIDGE (OGDEN CANAL)
SOUTH HALSTED ST. BRIDGE.

OFFICE, 225 DEARBORN ST.

CHICAGO.

C. E. GROVER, Prest.
D. R. HANNA, V. Prest.

W. A. COLLIER, Sec. & Treas.
CAPT. PHILIP SHIED, Marine Supt.



The Ashtabula Tug Co. Main St. Bridge,
INCORPORATED. W. A. COLLIER, Gen. Mgr. CLEVELAND, O.
CLEVELAND, Tel. 409. ASHTABULA, Tel. 149.

JOHN HAUG, Consulting Engineer and Naval Architect.

Ship and Engineer Surveyor Lloyds Register, London.
Plans, Specifications and Superintendence of Ships and their Machinery.
Specialties—Bulk Oil Vessels High Speed Yacht Engines, etc. 206 Walnut Place, Philadelphia.

P. M. CHURCH & CO.,
SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH
LEADING DEALERS IN
Ship Chandlery,
Marine Hardware, Paints, Oils, Packings, Cordage, Etc.
FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

The Chase Machine Co.

111 Elm St., Cleveland, O.

MACHINISTS and ENGINEERS

MANUFACTURERS OF
Land and Marine Engines
and Steam Pumps.

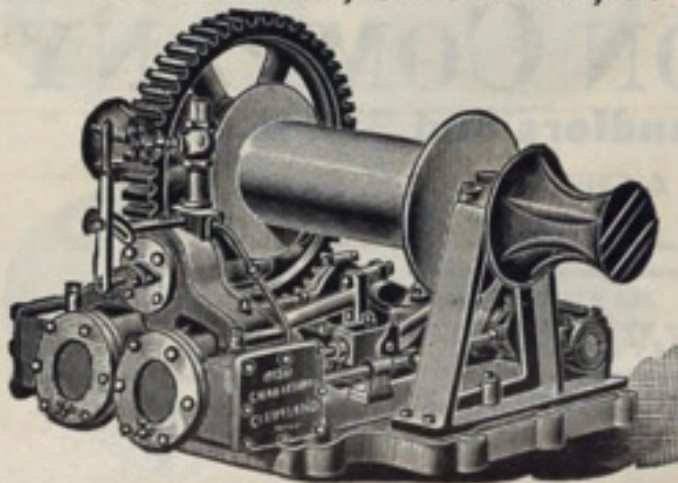
SOLE OWNERS AND MANUFACTURERS OF
Chase Fog Whistle Machine.

Over 150 in use on the best class
of Lake Steamers.

Special Attention given to

MARINE REPAIR WORK.

Engineers' Supplies.
Asbestos Pipe and Boiler Covering.
TELEPHONE 994.



F. W. WHEELER,
President.

E. T. CARRINGTON,
Vice-President.

C. W. STIVER,
Secy. and Treas.

F. W. WHEELER & CO.,

WEST BAY CITY, MICH.

Builders of all kinds of METAL AND WOODEN SHIPS.

AMERICAN CHAIN CABLE WORKS.

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

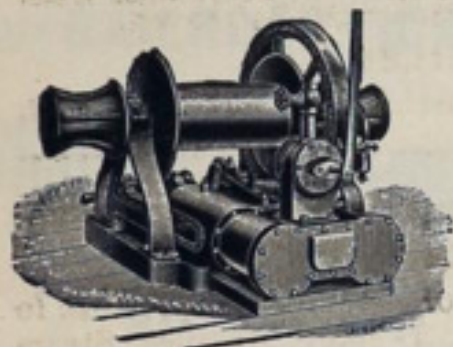
Our Dredge and Crane Chains are made of Iron Rolled Specially for that purpose in three qualities, "Burden's," "H. B. & I." iron, and "Burden's Best Best" iron.

THE J. B. CARR COMPANY, TROY, NEW YORK.

THOS. DREIN & SON, TATNALL AND RAILROAD STS., WILMINGTON, DEL.



Builders of Metallic Life Boats and Rafts, Yachts and Pleasure Boats, Life Preservers. Outfit for Lake Steamers a Specialty.



DOCK and DECK HOISTS
ALL KINDS OF
Machinery & Friction Hoists.

SEND FOR PRICES AND CIRCULARS.

JACKSON & CHURCH,
SAGINAW, MICH.

THE "CINCINNATI"
AUTOMATIC
STEAM STEERING GEAR
A Simple, Powerful Machine. Noiseless and Sure.
SEND FOR CIRCULAR. **FRONTIER IRON WORKS,**
DETROIT, MICH.

HOWARD H. BAKER & Co.

Ship Chandlers and Sail Makers,

18 to 26 Terrace. BUFFALO, N.Y.

H. CHANNON COMPANY

Ship Chandlers and Sail Makers.

AGENTS FOR

RYLANDS BROS.

MANUFACTURERS OF

ENGLISH GALVANIZED STEEL HAWSERS,

24-26 Market Street, CHICAGO, ILL.



B. B. INMAN, Manager.

H. G. INMAN, Sec'y and Treas.

Inman Tug Line.

Office on N. P. Dock, Open Day and Night.

TELEPHONE 146

DULUTH, MINN.

Finest outfit at the head of the lakes for log towing.

TUGS.

M. D. Carrington
E. T. Carrington
J. L. Williams
Bob Anderson
Joe D. Dudley
W. B. Castle

L. L. Lyon
F. H. Stanwood
Buffalo
Record
Effie L.
Edward Fiske

P. B. Campbell
Pathfinder
A. C. Adams
Mystic
Lida

Tugs, Hawsers, Steam Pumps, Lighters and Divers Furnished on Short Notice. Also owners of Steamer Belle Cross and Schooner Clement and Chicago Board of Trade. Three 12-inch Am. Fire Engine Company's Wrecking Pumps, and one 12-inch Worthington Pump.



H. E. STEVENS.

TOM MEAD.

LEW PRESLEY

BUCKEYE STEAM FITTING CO.

Steam Fitters, Engineers Supplies,

Phone 4058.

AGENTS FOR

RAINBOW PACKING.

Open Day and Night.

117 River St., CLEVELAND, O.

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR
CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER
ON SHORT NOTICE.

654 Seneca Street,

Cleveland, Ohio.

DETROIT SHEET METAL AND BRASS WORKS

No. 64-66-68-70-72
ORLEANS STREET,
DETROIT, MICH.

Jobbers of..... Pipe, Valves, Fittings. Packing, Oil and
Engineers Supplies.

Contractors for High Class Steam Fitting, Steam Heating,
Plumbing, Copper Work, and all
Classes of Sheet Metal Work.

Manufacturers of Clark's Patent Metallic Life Raft, Side
Lights, Marine Hardware, Hurricane,
Cabin and Platform Lamps, Trip
Gongs, etc.

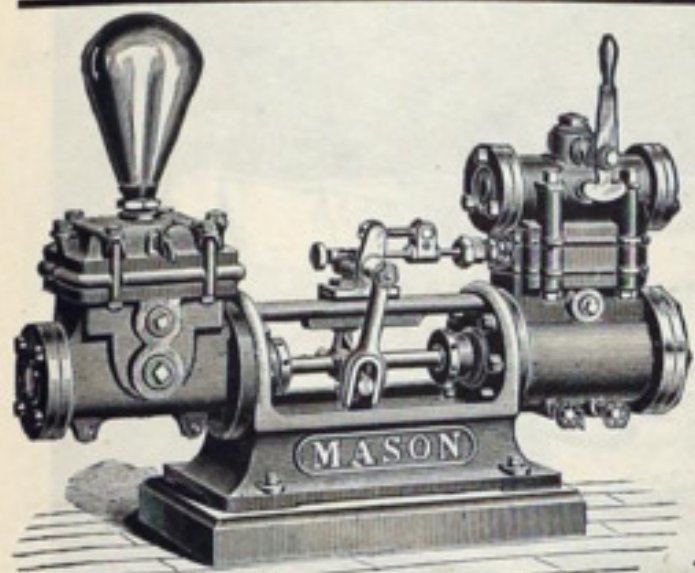
Agents for..... Laidlaw-Dunn-Gordon Steam Pumps,
Warren Webster's Specialties, and
Buffalo Forge Co.'s Fans, Engines and
Heaters.

Engineers can be waited on promptly day or night.

DIXON'S Graphite Pipe Joint Compound

Enables you to MAKE A TIGHTER JOINT than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.



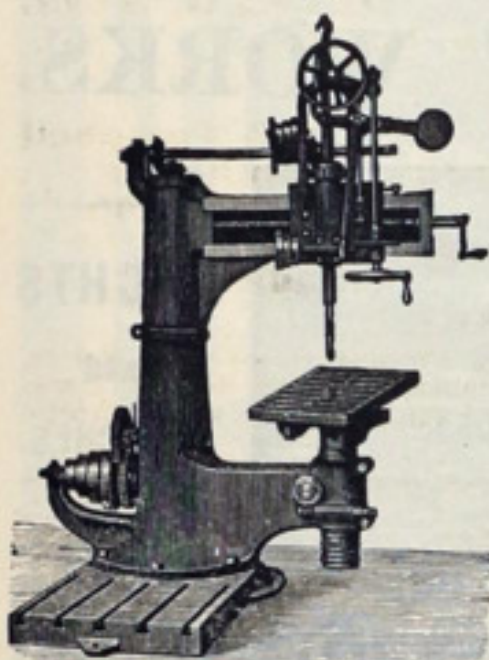
The Mason Steam Pump.

"IT CAN'T HANG UP"

Reducing Valves,
Pump Governors,
and Speed Regulators.

Adopted by U. S. Navy.

THE MASON REGULATOR CO., BOSTON, MASS.



Bement, Miles & Company,

PHILADELPHIA, PA.

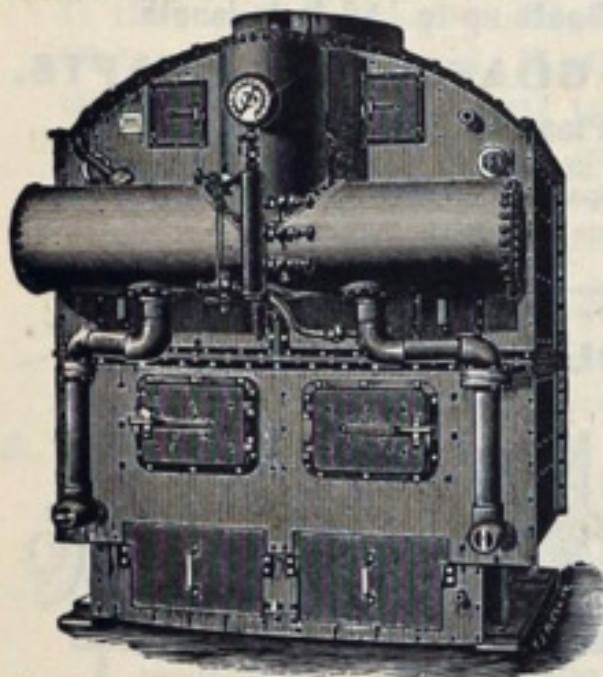
MANUFACTURERS OF

Metal Working Machine Tools

For Ship Yards, Railroad Shops,
Locomotive and Car Builders,
Machine Shops, Rolling Mills,
Steam Forges, Boiler Shops,
Bridge Works, etc., etc.

Steam Hammers, Steam and
Hydraulic Riveting Machines.

New York Office: Taylor Bldg. No. 39 Cortlandt St.
Chicago Office: 1534 Marquette Building.



ALMY'S PATENT SECTIONAL Water-Tube Boilers.

NOW USED IN

18 Passenger Boats from 70 to 160 feet long.
27 Steam Yachts from 50 to 160 feet long.
U. S. Torpedo Boat "Stiletto."
Numerous Small Launches and Stationary
Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,

No. 178-184 Allens Avenue,
near Rhodes St.
PROVIDENCE, R. I.


CHAS. H. POTTER & CO., Investment Bankers, Cleveland, O.

Dealers in

Lake Superior Iron Mining Stocks, Municipal, Water
Works and Street Railway Company Bonds.

We buy and sell for cash all securities listed on the New York, Boston,
Chicago, Philadelphia, Cincinnati and Pittsburgh stock exchanges.

In a large number of cases the Blue Book of American Shipping
has been sent on approval to ship owners, ship builders, marine engi-
neers and others interested in shipping. In every case the price of the
book, which is \$5.00, has been remitted immediately.



Paint your
Vessels with **Superior Graphite Paint.**
NO BLISTERING, CRACKING OR SCALING.
Made especially for Stacks, Decks, Sides, Hulls and Water Com-
partments. Strictly anti-rust, and most durable
and economical.
DETROIT GRAPHITE MFG. CO., 541 River St., Detroit, Mich.

DIXON'S Lubricating Graphite

Is fully explained in an INTERESTING AND INSTRUCTIVE
PAMPHLET which is FREE to all interested. It will pay all
Engineers and Machinists to SEND FOR IT.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Chas. Corv & Son

Manufacturers of the
Mechanical and Electric
Marine Telegraph,



Electrical
Helm Indicators
Electric Call
Bells.

Engine Bells and
Brass Work of
all descriptions,
Shrieking and
Siren Whistles.

278 DIVISION ST.,
NEW YORK CITY.

Alfred B. Sands & Son

Yacht Plumbers.

MANUFACTURERS OF
YACHT PLUMBING SPECIALTIES.

Pump Water Closets, for above or below
water line.
Folding Lavatories, Ventilators, Pumps,
Deck Plates, Etc.
134 Beekman St., NEW YORK.

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors.
Consolidated Cork Life Preservers. Superior to all others. Ring Buoys and Fenders.

SAFEST, CHEAPEST. Approved and adopted by U. S.
Board of Supervising Inspectors.
Also adopted by the principal Ocean, Lake and River
Steamer Lines as the only Reliable Life Preserver. Vessels
and the trade supplied. Send for catalogue.
Awarded four Medals by World's Columbian Exposition



Metallic
and
Wooden
Life
Boats.



Metallic Life Rafts, Marine Drags.

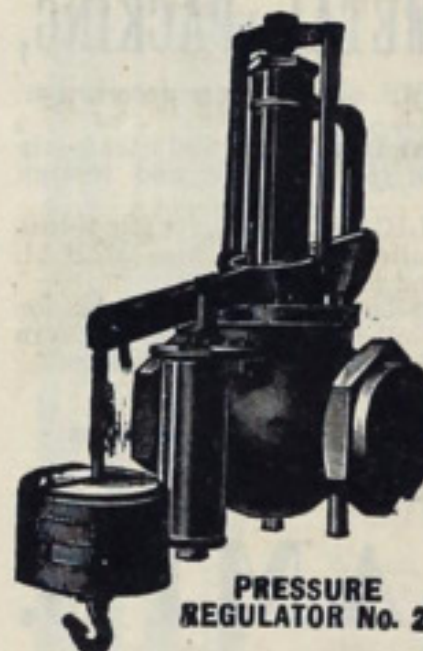
Manufacturer of Woolsey's Patent Life Buoy, which is the
lightest, cheapest and most compact Life Raft known.

Send for Illustrated Catalogue.

Get our prices before buying elsewhere.

D. KAHNWEILER,

437 Pearl Street, NEW YORK CITY.



PRESSURE
REGULATOR No. 2

The "DAVIS" Pressure Regulator and Reducing Valve.

Is the simplest and best for reducing the pressure to
Steam Steering Engines, Donkey Engines, Steam
Winches and all places requiring a uniform pressure
below that of boilers.

No diaphragms, spring or packing.
Cut shows scale weights. We can furnish lever and
sliding ball weight if preferred.

MANUFACTURED BY

G. M. DAVIS & CO.

106 N. Clinton St., CHICAGO, ILL.

FOR SALE BY

R. E. Hills, Chicago. U. H. McCutcheon, Buffalo
Geo. Worthington Co., Cleveland.
P. M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit
Jas. Clements & Son, Bay City, Mich.
Cleveland Ship Building Co., Cleveland.
Chicago Ship Building Co., Chicago.

Selling agents—The McIntosh-Huntington Co., Cleveland, O.; The Detroit Sheet Metal
and Brass Works, Detroit, Mich.

SHERIFFS MANUFACTURING COMPANY,

Manufacturers of

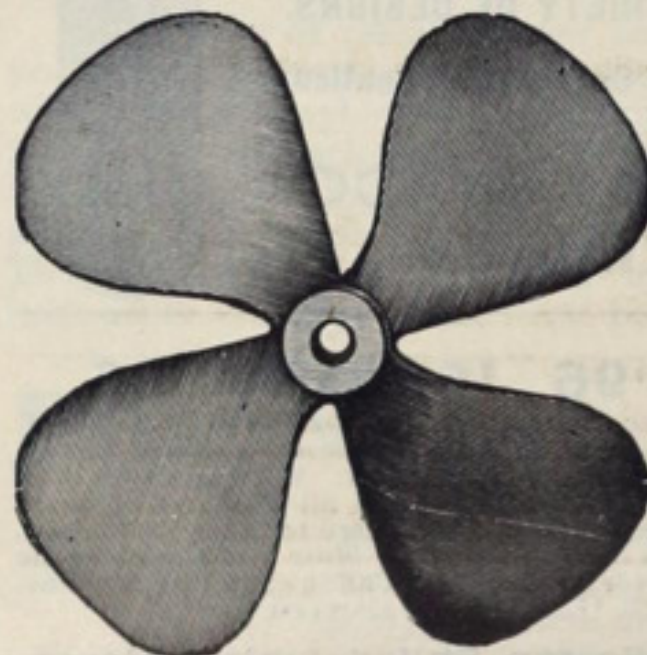
Propeller

Wheels.

MARINE ENGINES AND
REPAIRS.

Milwaukee, Wis.

TELEPHONE S.-163.



McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

SOLE MAKERS OF THE

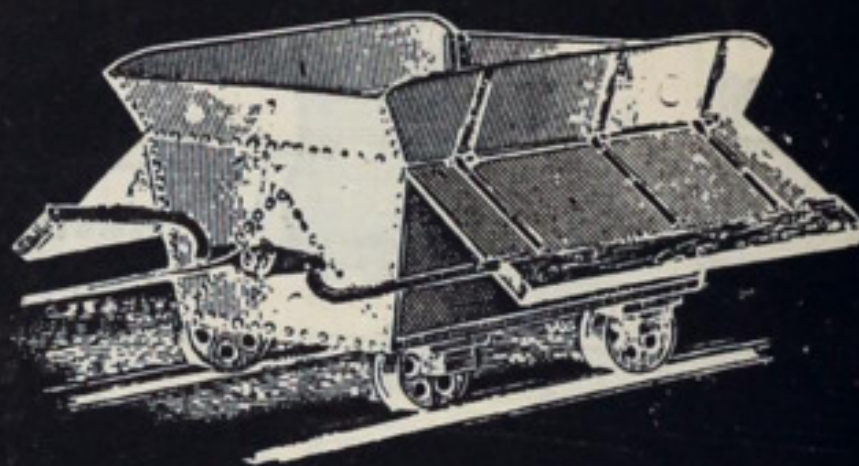
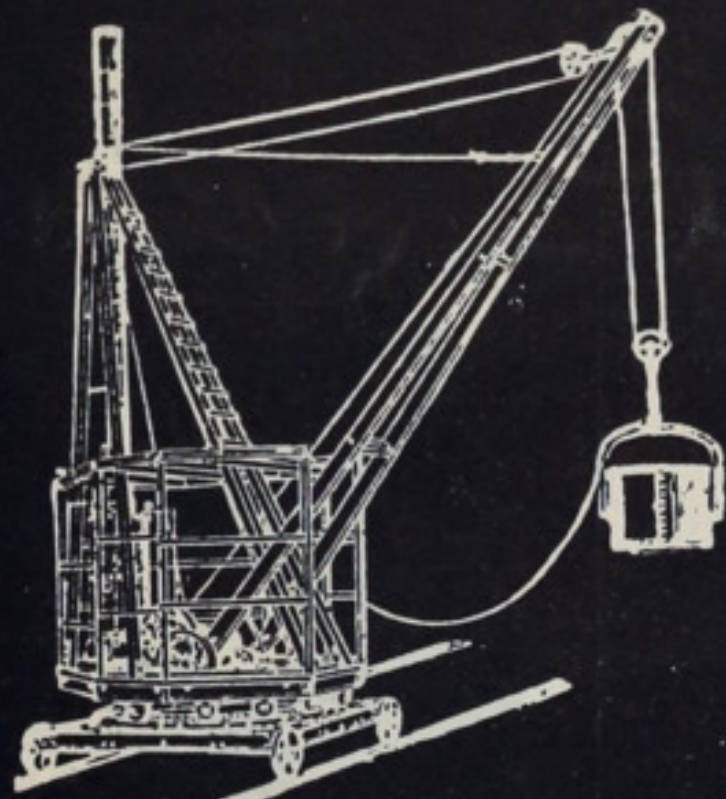
McMYLER PATENT REVOLVING STEAM DERRICK

FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.

BUILT FOR ANY CAPACITY WANTED

BUILDERS OF
CONVEYORS, COAL BUCKETS, ORE
BUCKETS AND DUMP CARS.



"IMPROVEMENT THE ORDER OF THE AGE."

IF YOU DESIRE TO LEARN

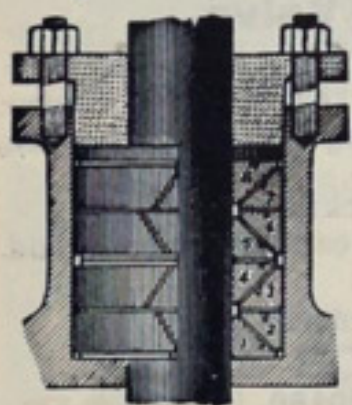
Respecting the merits of the THREE NEW MODELS, Nos. 2, 3 and 4, SMITH PREMIER TYPEWRITERS, drop us a line. They embody the Most Progressive Mechanical Principles, and are "up-to-date" in every respect.

The Smith-Premier Typewriter Co.

348 Superior Street, City Hall Building, CLEVELAND, OHIO.
Competent Operators Furnished. TELEPHONE 339.

Any captain who takes pride in the appearance of his vessel naturally wants a good picture of her. Very few good photographs of lake steamers at regular speed have ever been taken in open water, and therefore a number of captains have paid large sums for oil paintings of their vessels. This is not necessary now, as the Review has a first-class marine photographer on the Detroit river, who will take a photograph of your vessel, more accurate and artistic than any oil painting. One print, 11 by 14 inches, for \$2, and three for \$5. Wire or write the Review at once.

KATZENSTEIN'S Self-Acting METAL PACKING,



For PISTON RODS, VALVE STEMS, etc., of every description, for Steam Engines, Pumps, etc., etc.

Adopted and in use by the principal Iron Works and Steamship Companies, within the last twelve years, in this and foreign countries.

FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints on Steam Pipes, and for Hydraulic Pressure; also METAL GASKETS for all kinds of flanges and joints.

DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for Steamers. Also Agents for the McColl-Cumming PATENT LIQUID RUDDER BRAKE. For full particulars and reference, address:

L. KATZENSTEIN & CO.,

General Machinists, Brass Finishers, Engineers' Supplies,
357 West St., New York.



SHIP LAMPS.

OIL AND ELECTRIC FIXTURES

FOR

Steamships, Yachts, &c.

GREAT VARIETY OF DESIGNS.

Prices and Cuts on Application.

PAGE BROS. & CO.,

347 to 357 Cambridge St. Boston, Mass



'96 JENKINS '96

Is the Perfection of Joint Packing, Instantaneous, Does not Squeeze out and not necessary to follow up joint. We guarantee it to last for years on any and all pressures of steam or any kind of joint where packing is required. Does not rot, burn or blow out, therefore the best for all purposes. Call for and insist on having '96 JENKINS '96 stamped like cut.

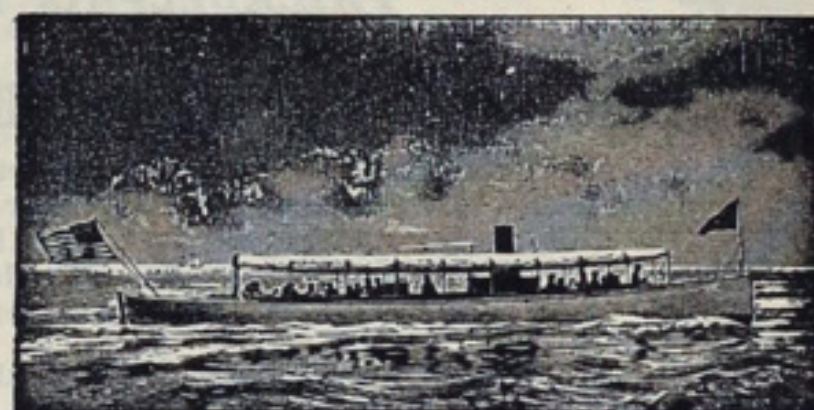
JENKINS BROS. New York, Boston, Philadelphia, Chicago

DETROIT BOAT WORKS.

STEEL

and

WOODEN



YACHTS

and

LAUNCHES.

BUILDERS OF

ELECTRIC LAUNCHES, DETROIT, MICH.

Any Class Wooden, Iron or Steel Boats up to 150 ft. in length.

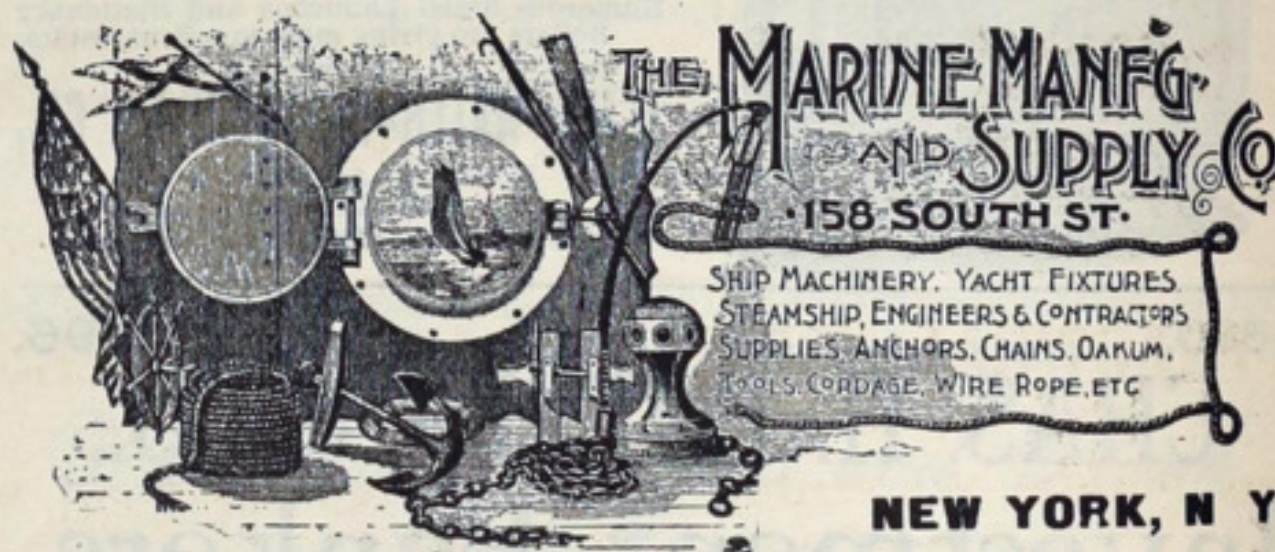
YAWLS. METALLIC LIFE BOATS. LIFE RAFTS.

All kinds of Small Pleasure Boats.

The electric launches used on the lagoons at World's Fair were manufactured by this company.

Send for new illustrated Catalogue of electric launches.

For special prices on DEADLIGHTS, write



THE MARINE MANFG. AND SUPPLY CO.
158 SOUTH ST.

SHIP MACHINERY. YACHT FIXTURES.
STEAMSHIP ENGINEERS & CONTRACTORS
SUPPLIES, ANCHORS, CHAINS, OAKUM,
TOOLS, CORDAGE, WIRE ROPE, ETC

NEW YORK, N. Y.

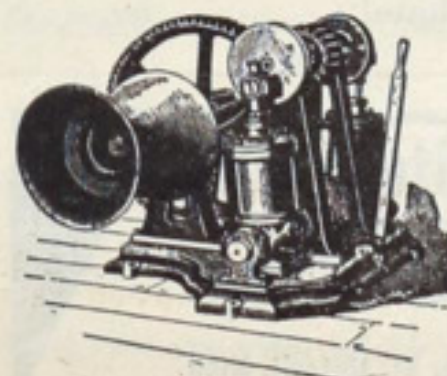
MIERS CORYELL

Consulting Mechanical Engineer.

21 E 21st Street, NEW YORK.

Plans, Specifications and Superintendence. Marine and Water Works Engines and Boilers.

The Blue Book of American Shipping answers questions that arise daily in every vessel agent or owner's office. If the book is not satisfactory it costs nothing, as the \$5.00 will be returned. Order at once, No. 409 Perry-Payne building, Cleveland.

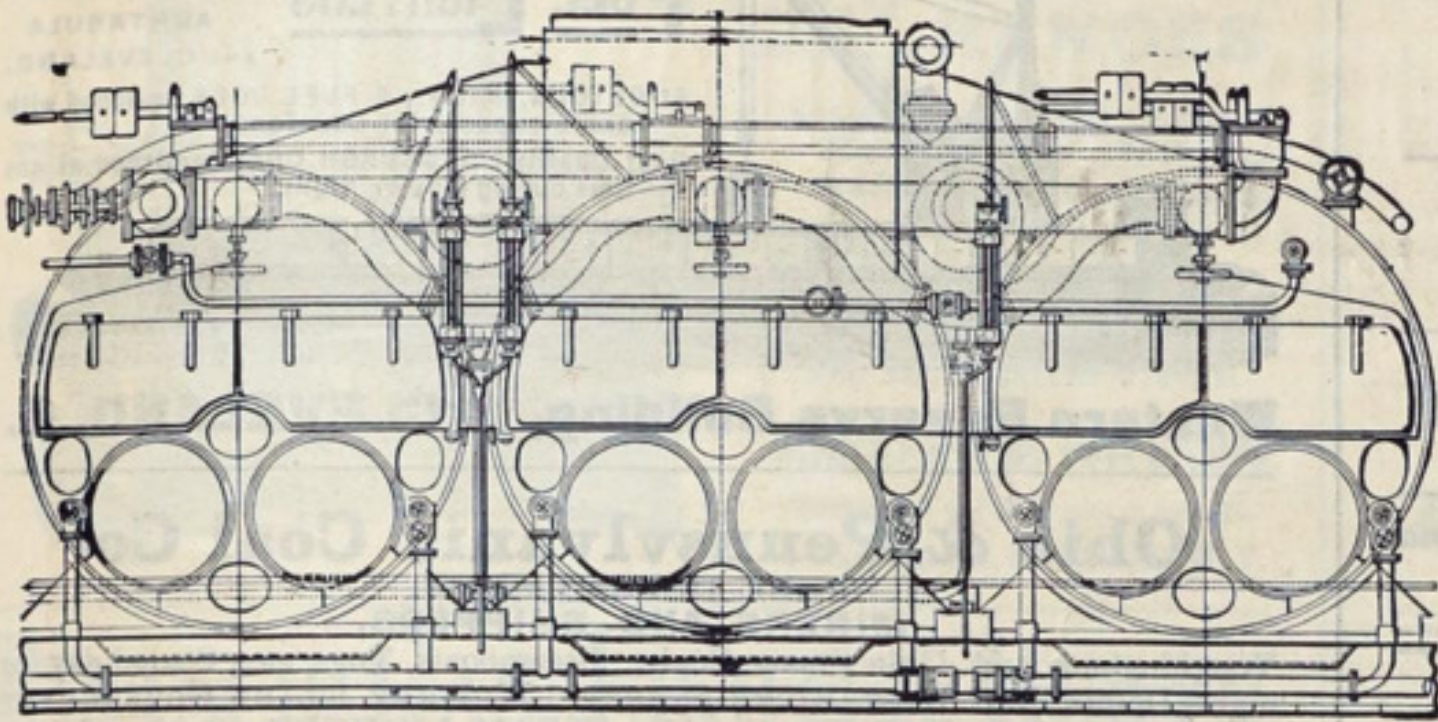


Hoisting Engines.

We build them in all sizes from new and improved designs. Every engine thoroughly tested before leaving our shop, and guaranteed to be satisfactory in every case. When in want of a Hoist for marine work, dock work, mining or any other purpose, kindly permit us to name you prices. We know we can please you.

Marine Iron Co., Bay City, Michigan.

LAKE ERIE BOILER WORKS, BUFFALO, N. Y.



THE BEST EQUIPPED PLANT
IN AMERICA

FOR THE MANUFACTURE OF

MODERN MARINE BOILERS.



Nickel Plate Ahoy? Aye, Aye Sir!
The line to hail and the line to take
To reach your craft to fit her out,
Is the well-known, ship-shape Nickel Plate Route.
Chicago, Cleveland, Buffalo,
Or any port you want to go,
The shortest time and lowest rate
Are shipmates with the Nickel Plate.

A SUPERB DINING CAR SERVICE.

For particulars inquire of

A. W. JOHNSTON,
Genl. Supt.

or, B. F. HORNER,
Genl. Pass. Agt.

CLEVELAND, O.

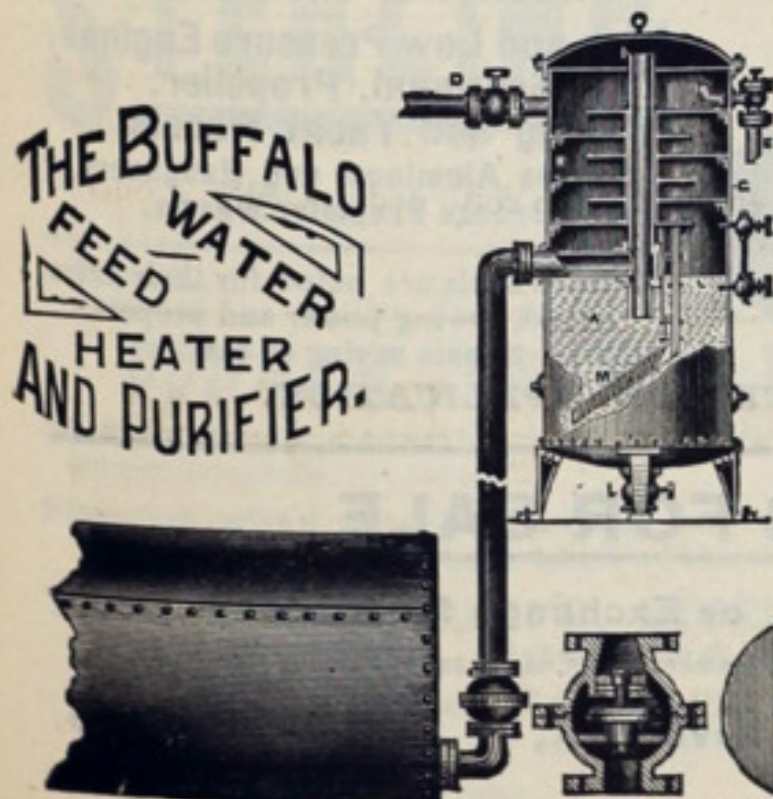
"The most perfect feed water heater and purifier we ever saw."—R. HAMMOND.

IN PRACTICAL USE ON 25 LAKE STEAMERS.

Every Purifier Warranted to Remove all Sediment or
Scale-Forming Substance.

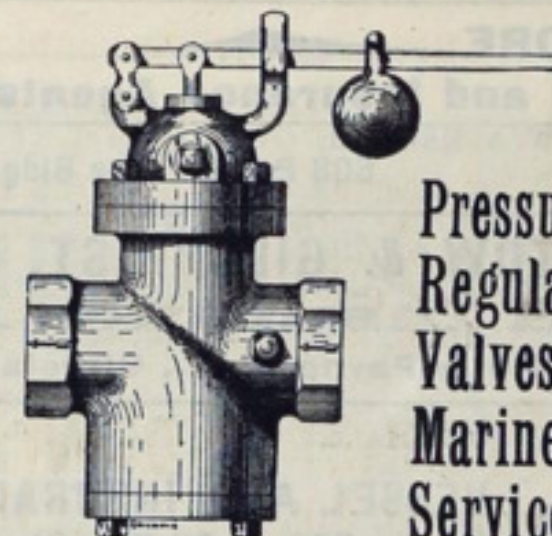
ROBERT LEARMONTH PATENTEE,

200 BOUCK AVENUE, - - - - - BUFFALO, N. Y.



REFERENCES.

- A.—Settling chamber.
- B.—Boiler.
- C.—Feed pipe to boiler.
- D.—Steam pipe.
- E.—Water supply pipe.
- F.—Check valve.
- G.—Spray disks.
- H.—Spray chamber.
- I.—Equalizing tube.
- J.—Blow-off pipe.
- K.—Automatic shut-off valve.
- L.—Division plate.
- M.—Deflector and separator.



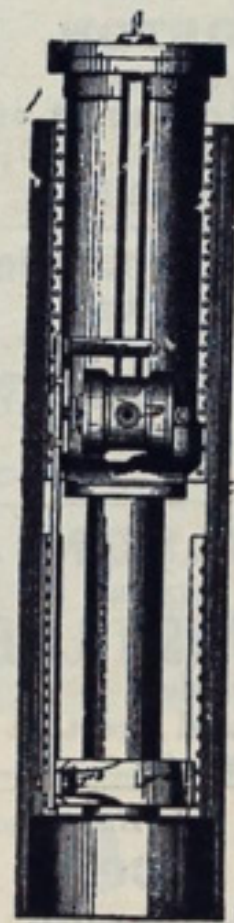
Pressure
Regulating
Valves for
Marine
Service.

Special attention given to
Marine Engine and Pump
Repairs.

Write for Estimates and Catalogue.

C. H. BURTON PUMP WORKS

Main St. cor. Center, CLEVELAND, O.



A. J. DUPUIS,

16 Atwater Street W., DETROIT, MICH.,

CONTRACTOR FOR

Dock Building, Bridge and Trestle Work,

Pile Driving and Foundation Work.

Dry Dock Building; builder of Detroit Dry Dock Co's
New Dry Dock.

PATENTEE AND MANUFACTURER OF

Dupuis Steam Pile Driving Hammer

Which is very effective, in that it is forced by steam in the down stroke, (which is not the case in other pile drivers), making the ram strike a quick and powerful blow. One advantage of this Hammer over others is, that the steam hose is inside the leaders, and not in the way of hoisting the piles as is the case in other steam hammers.

TWO SIZES of these Hammers are made, one weighing 5000 lbs. and one 7000 lbs. THE WORKING OF HAMMERS GUARANTEED.

A number of vessel owners have given orders to the Review to photograph their vessels when passing in the Detroit river at a point where the atmosphere is clear, with no docks or other objectionable features in the back ground. We have stationed the best marine photographer on the lakes on the river to fill these orders. We would be pleased to photograph your boat if you will wire or write us at once. The finished picture will be 11 by 14 inches, mounted on 14 by 17 inch cards. One print \$2, three prints \$5.

FOR SALE

60x10 ft. **STEAM LAUNCH**, 4½ Compound Engine and Condensers, Steam Pumps, etc., Kitchen, Berths, fully equipped, and in first-class order. For particulars inquire Room 65, 94 La Salle Street CHICAGO, ILL.

STEAM ENGINEERING
(Loco., Stat'y. and Marine); Electricity; Mechanics; Mechanical and Architectural Drawing; Plumbing; Architecture; Mining; Civil Engineering in all Branches.

The International Correspondence Schools



To Steam...
Engineers,
Machinists, Electrical Workers, Civil Engineers, Draughtsmen, Steam Fitters, Miners, Carpenters, Plumbers.
References Everywhere.
Send for Circular.
State Subject you wish to Study.
Box 965 Scranton, Pa.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

ALBERT J. GILCHRIST, PROCTOR IN ADMIRALTY,
No. 604 PERRY-PAYNE BLDG., CLEVELAND, OHIO.

C. E. KREMER, Attorney and Counselor-at-Law and
Proctor in Admiralty.
Rooms 14, 15 and 16, Bryan Block. 164 LA SALLE ST., CHICAGO, ILL.

BROWN & COOKE,
Counselors at Law and Proctors in Admiralty,
34-35-36 White Building, BUFFALO, N. Y.

HAWGOOD & MOORE W. A. HAWGOOD.
J. W. MOORE.
Vessel and Insurance Agents,
Residence Phone, Doan 446—W. A. Hawgood.
Long Distance Tel. 2395. 608 Perry-Payne Bldg., CLEVELAND, O.

J. H. BARTOW. **BARTOW & GILCHRIST,** TELEPHONE 717.
C. P. GILCHRIST.
Vessel and Insurance Agents,
611 and 612 Perry-Payne Bldg., Cleveland, O.

ALEX. CLARK. **J. B. HALL.** **J. H. KILLERAN,**
Marine Surveyor.
A. Clark & Co. VESSEL AND INSURANCE AGENTS,
Tel. No. 892. 55 Main St., BUFFALO, N. Y.

JOHN MITCHELL. **JOHN F. WEDOW.** **ALFRED MITCHELL.**
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO
Office Telephone, 757. Residence, John Mitchell, 3506.

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg.
CLEVELAND, OHIO.
Telephone 2585.

C. W. ELPHICKE. **JAS. A. MYERS.**
A. L. FITCH.
C. W. ELPHICKE & CO.
GENERAL INSURANCE AGENTS,
Room 10, No. 6 Sherman St., Chicago, Ill.

H. J. WEBB & Co.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1856. H. J. Webb & Co.
will charter vessels for the lake trade.
Special attention given to chartering vessels in the Lake Superior Iron Ore trade, both for the season and single trip.
No. 606 & 607 Perry-Payne Building, Cleveland, O. Office Telephone No. 338, Residence No. 3228.

J. T. ROSE. **FRANK B. LAZIER.**
ROSE & LAZIER,
Vessel Agents and Brokers,
and Marine Insurance,
16 Board of Trade,
DULUTH, - - MINN.

PATENTS

QUICKLY SECURED. Trade-marks and Copyrights registered and patent business of every description promptly and skillfully conducted at lowest rates. Inventions introduced, companies formed, and PATENTS SOLD ON COMMISSION. 25 years' experience. Highest references. Send us model, sketch or Photo. of invention, with explanation, and we will report whether patentable or not, free of charge. OUR FEE PAYABLE WHEN PATENT IS ALLOWED. When patent is secured we will conduct its sale for you without extra charge. 32-PAGE HAND-BOOK and list of 200 inventions wanted mailed to inventors free upon request. This is the most complete little patent book published and every inventor should WRITE FOR ONE. **H. B. WILLSON & CO.,** Patent Solicitors, Le Droit Bldg., WASHINGTON, D. C.

H. S. LORD. **J. H. NORTON.**
LORD & NORTON,
Attorneys-at-Law,
Proctors and Advocates in Admiralty,
DULUTH, MINN.

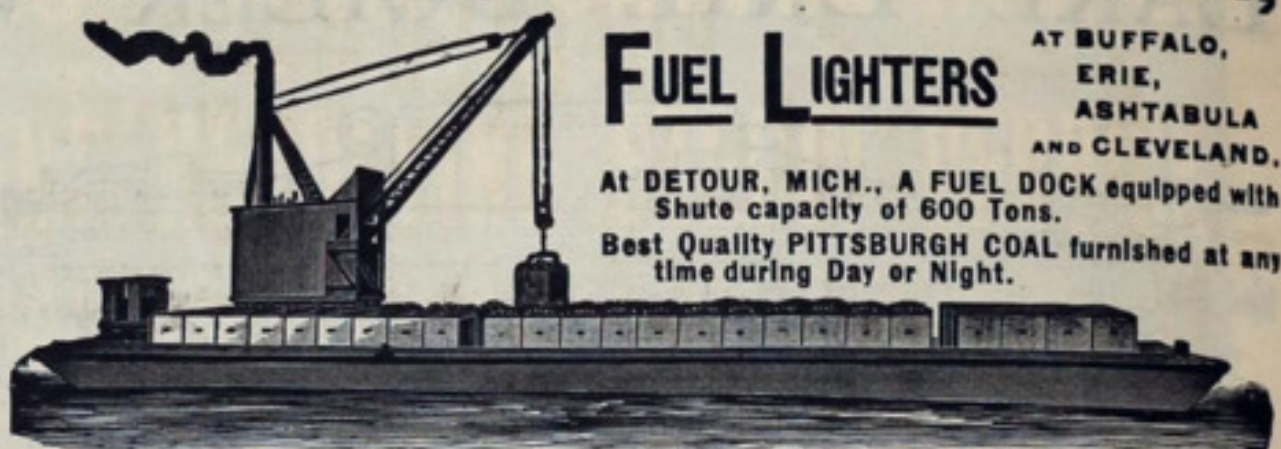
White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

C. F. Palmer. **C. L. Hutchinson**
PALMER & CO.,
Vessel Agents and Underwriters,
515 Perry-Payne Bldg., Cleveland, Ohio.
Telephone 644.

The M. I. Wilcox
CORDAGE & SUPPLY CO.
Steamboat, Vessel and Mill
Supplies.
STEAM YACHT, "MINNIE D."
210-216 Water Street,
TOLEDO, OHIO.

Pickands, Mather & Co.,



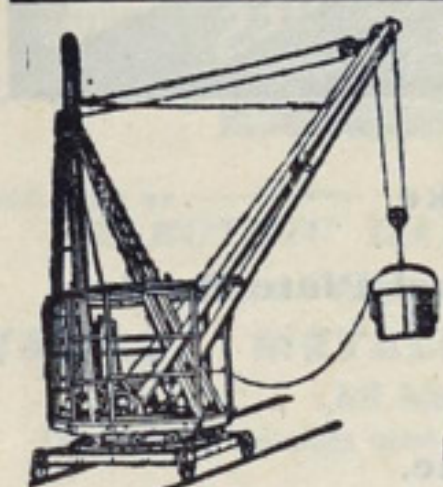
Western Reserve Building, CLEVELAND, O.

Ohio & Pennsylvania Coal Co.

FUEL DEPARTMENT.
MINERS AND SHIPPERS,
Youghiogeny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

THE PITTSBURGH AND CHICAGO GAS COAL CO.
MINERS AND SHIPPERS OF
Pittsburgh and Youghiogeny Coal.

Fuel Docks West Side of Main River, Cleveland, Ohio, just above Main St. Bridge. Latest equipment for rapid fueling of Steamers at all hours, day or night. Fuel Lighter 300 tons capacity; buckets 2½ tons capacity.
Telephone { Office 1888.
Fuel Dock 1590,
Ore Dock, 2413. J. A. DONALDSON, Agent,
420-421 Perry-Payne Building.

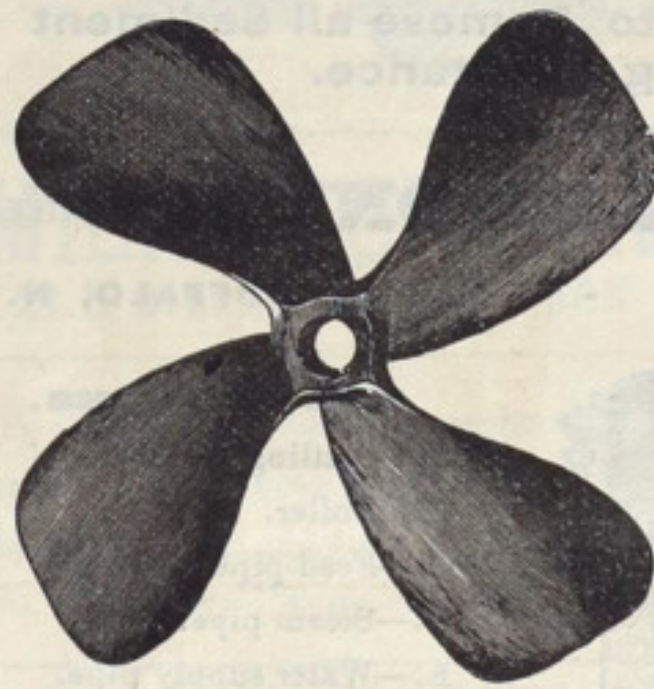


TOLEDO FUEL CO.,

Cambridge, Hocking, Jackson
and Massillon Coal
Wheeled on or put on with DERRICK.
NIGHT OR DAY.
SATISFACTION GUARANTEED.
H. H. WILLIAMS, Manager.
Located on Penn. Dock, TOLEDO O.
GET OUR PRICES. Phone 1441.

H. A. BARR, PRESIDENT, **F. H. VAN CLEVE, SEC.** **CAPT. GEO. BARTLEY, SUPT.**
Escanaba. Escanaba. Escanaba.
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, { Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch-
Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, { Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, { Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction

H. G. TROUT,
KING IRON WORKS,



BUFFALO, N. Y.
MANUFACTURERS OF
TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT
And STEEPLE COMPOUND
MARINE ENGINES,
High and Low Pressure Engines,
Sectional. Propeller,
Tug and Yacht Wheels,
Cowles Aluminum and Manganese
Bronze Propeller Wheels.

These Wheels are noted for their extra speed, towing power and proportionate saving of coal.

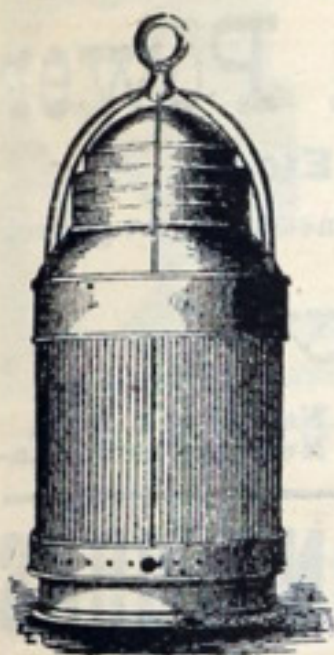
PRICES QUOTED ON APPLICATION.

PRIVATE CAR FOR SALE

or Exchange for a Steam Yacht.

—FOR FULL PARTICULARS, ADDRESS—

E. D. BROWN, - 26 River St., - CHICAGO, ILLS.



Buffalo Signal Lamps,

For Steamers and Sailing Vessels.

Patent Fluted Lens and Perfect Colors
GET THE BEST AND AVOID COLLISIONS.

Manufactured by

RUSSELL & WATSON,

Successors to FELTHOUSEN & RUSSELL,

145 Main St.

BUFFALO, N. Y.

SEND FOR CATALOGUE.

PINTSCH GAS LIGHTED BUOYS

Adopted by the English, German, French, Russian, Italian,
and United States Light House Departments, for
channel and harbor lighting; over 500 gas
buoys and gas beacons in service.

BURN CONTINUOUSLY from 80 to 365 days and nights without atten-
tion, and can be seen a distance of six miles.

Brilliant and steady illumination.

Economical and reliable in operation.

CONTROLLED BY THE

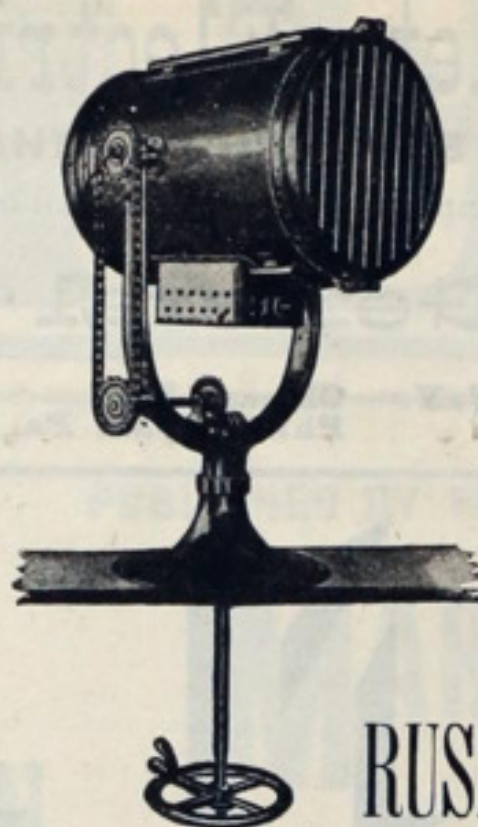
SAFETY CAR HEATING & LIGHTING COMPANY,

160 Broadway, New York City.



ALL NEW HYDROGRAPHIC CHARTS ARE KEPT IN STOCK BY THE
MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND.

CAPTAINS AND MATES ARE INVITED TO CALL AT THE OFFICE OF THE
MARINE REVIEW AND LOOK OVER THE CHARTS AND SAILING DIRECTIONS
OF LAKES SUPERIOR, MICHIGAN, HURON, ERIE AND ONTARIO, PUBLISHED
BY THE HYDROGRAPHIC OFFICE.



PROJECTORS!

10 MILLION TO

100 MILLION

CANDLE POWER.

The only successful commercial light.

Adopted and endorsed by leading
steamship lines and builders.

Have Replaced All Other Makes.

CATALOG NOW READY.

RUSHMORE DYNAMO WORKS,

Type D. Pilot House.

JERSEY CITY, N. J.

THE Swain Wrecking Co.
E.M. PECK, Pres.

The TUG FAVORITE
STATIONED AT CHEBOYGAN, MICH.
WITH COMPLETE WRECKING OUTFIT
IN CHARGE OF
Capt. P. L. Millen
CANADIAN WRECKER-SAGINAW
STATIONED AT DETROIT, MICH.
ENABLES US TO WRECK IN CANADIAN
WATERS
STEAM PUMPS AND SUB-MARINE
WORK IN CHARGE OF
JOHN S. QUINN
Address all communications to
PARKER & MILLEN
OFFICE
15 ATWATER ST. WEST
DETROIT, MICH.

4 STEAM PUMPS, 10 JACKS, 3 HAWSERS.

1 COAL AND ORE PUMP
3-12 INCH ROTARY,
1-14 INCH WORTHINGTON.

10-100 TON JACKS
1-12 INCH HAWSER
1-10
1-9

1896 SEPTEMBER.

6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

TELEGRAPH
PARKER & MILLEN,
DETROIT, MICH.

Capt. P. L. Millen
CHEBOYGAN, MICH.

STERLING, WELCH & CO.

12 and 14 Euclid Ave., CLEVELAND, O.

BOAT FURNISHING A SPECIALTY.

CARPETS, OIL CLOTHS,

CURTAINS, &c., &c.

SUPPLIED AT WHOLESALE RATES.

J. S. DUNHAM,
President.

CAPT. THOS. JOHNSON,
Chief Engineer & Wrecking Master.

CAPT. J. R. SINCLAIR,
Superintendent.

DUNHAM TOWING & WRECKING CO.

15 TUGS AT CHICAGO,
Chicago Telephone, No. 852 Main.

4 TUGS AT SO. CHICAGO,
So. Chicago Telephone, No. 63.

Steamers when outside wanting our tugs, blow one long and one
short blast of the whistle.

**TUGS, STEAM PUMPS, DIVERS, HAWSERS, LIFT-
ING SCREWS, LIGHTERS, Etc., for Releasing
Stranded or Raising Sunken Vessels,**

Furnished promptly on orders by telegraph or otherwise.

Office open Day and Night.

210 South Water Street,

Private Telephone on 16th St. Ry. bridge,
and at Life Saving Station, South Pier.

CHICAGO, ILL.

G. H. FOSTER, Prest.

MARK H. HANLON, V.-Prest. & Secy.

W. H. WARNER, Treas.

DAVID BARNHISEL, Gen'l Mgr.

The Inter-Ocean Coal & Coke Co.

General office, 513 Perry-Payne Bldg., Cleveland.

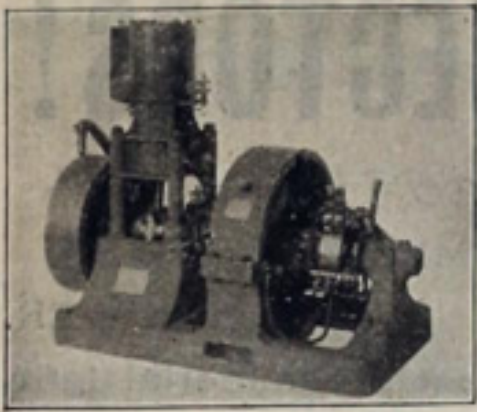
PRODUCERS AND SHIPPERS.

**Choicest Grades of YIOUGHIOGHENY COAL
FOR STEAMBOAT FUEL.**

Lighter in Cleveland Harbor of 400 tons capacity.

CLEVELAND DOCKS. just north of Main Street bridge.

SAULT RIVER DOCK. just above Detour, known as Watson dock.



Complete Electric Plants for Light and Power On STEAMSHIPS, WHALEBACKS, YACHTS, DOCKS, WHARVES, Etc.

Our system is complete in every detail. All our appliances are made to Governmental and Insurance requirements and are perfect. Write for prices and catalogues.

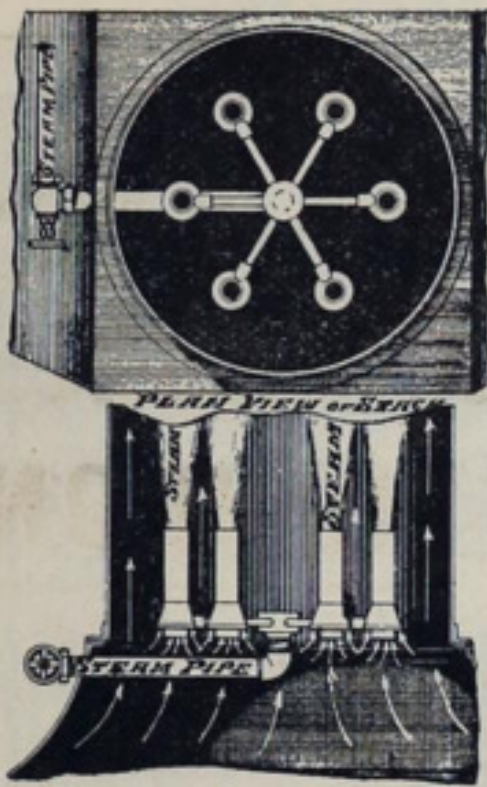
General Electric Company.

SALES OFFICES

Schenectady, N. Y. Chicago, Ill. Detroit, Mich. Buffalo, N. Y. Columbus, O. New York, N. Y.
Boston, Mass. Philadelphia, Pa. Baltimore, Md. Portland, Ore. San Francisco, Cal. New Orleans, La.

FRONTIER IRON WORKS

MARINE ENGINES, DETROIT, MICH.



SECTION VIEW OF STACK
SHOWING JET IN OPERATION.

The Annular Steam Jet

For Smoke Stacks of Steam Boilers.

Acknowledged as the most powerful and economical jet on the market, giving results equal to forced draft with fan. Works well at all steam pressures.

In use on the fast Sound Steamer City of Lowell and famous Delaware River Strs. City of Chester and Brandywine, together with several Cuban and Mexican Strs. Also many Steamships, Side Wheel and Propeller, Lake, Bay and River Strs. Cut on the right shows sectional view of castings, which are spaced at equal distances throughout the stack, making an equal subdivision of its area. These castings are attached to pipes radiating from a central casting attached to steam pipe, as shown on the left. Steam is supplied through these pipes to each casting discharging through an annular opening, as shown by dotted lines, causing a current of air and gases to flow through the central and outside air passages, and discharge at a high velocity up the stack, as shown by arrows. Prompt delivery of orders guaranteed.

Address **H. BLOOMSBURG & CO.,**

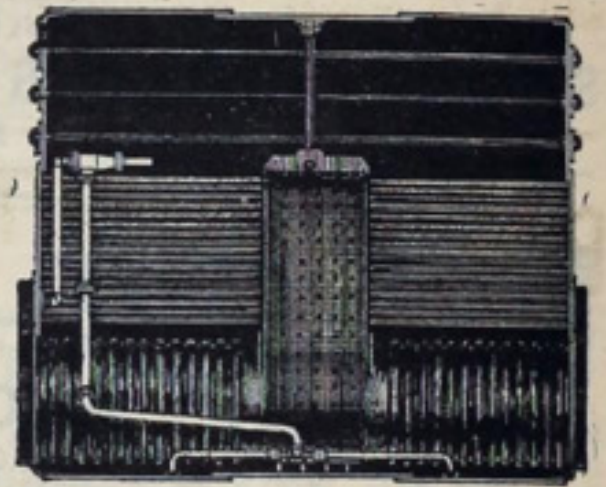
Main Office, Newport News, Va.

Branch Office, 818 Adams St., Wilmington, Del.

The Equilibrium Circulator

For Heating and Circulating the Water in Steam Boilers.

Equalizes expansion and increases evaporation, thereby saving coal and preventing leaks, thus saving cost of repairs. Prevents foaming or priming and pitting, thus increasing safety and prolonging life of boiler. In use on the International Nav'n Co's Steamers Paris, Southwark, Pennsylvania and Illinois; Steam Ships Gloucester and Howard of Merch'ts and Miners Line; Sound Steamers City of Lowell and Richard Peck; fishing steamer Al. Foster; Delaware River Steamers City of Chester and Brandywine; and many steam yachts and tug boats, giving remarkable results. Used by Harlan & Hollingsworth Co., Bath Iron Works, Maryland Steel Co., and others. Castings carried in stock for prompt delivery.



Circulating Apparatus in Boilers
of the Ocean Greyhound
Str. Paris.

THE Bethlehem Iron Company

WORKS and PRINCIPAL OFFICE:

SOUTH BETHLEHEM, PENNA.

Steel Forgings of all descriptions

For Marine Engines

Fluid Compressed, Hollow, Hydraulic Forged
and Annealed Forgings a Specialty.

NEW YORK OFFICE, - - - **100 Broadway.**
PHILADELPHIA OFFICE, - - - **421 Chestnut St.**
CHICAGO OFFICE, - - - **Marquette Bldg.**

The United States Standard Register of Shipping.

Providing the only Standard Classification based on Construction Rules
Designed for Lake Vessels.
Classed Vessels Receive the Lowest Rates of Insurance.

SURVEYORS.

SINCLAIR STUART, Surveyor of Iron and Steel Construction and Engineer Surveyor.

for District comprising Lakes Superior, Michigan and Huron and Lake Erie, as far East as, and including Cleveland, O.

EDWARD CASKIN, Potter Building, Main Street, Buffalo, N. Y., Surveyor for District comprising Lake Ontario and Lake Erie, as far West as, but not including Cleveland, O.

Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

The United States Standard Steamship Owners', Builders' & Underwriters' Ass'n, Ltd.
Post Building, 16 and 18 Exchange Place, NEW YORK.

FOR SALE at a Bargain.

The tug Henry—Cylinders, 16½x18; new steel boiler; steel boiler house; hull in first-class condition. This is a most favorable opportunity to procure a first-class tug for dredging outfit. For particulars apply to

WILLIAM TRUBY,

Fairport Harbor, O., where tug can be seen.



For Stationary, Portable, Traction Engines, Tugboats, &c.
Thoroughly Reliable—Perfectly Automatic.
JENKINS BROS., - Selling Agents.
NEW YORK, BOSTON, PHILA., CHICAGO.

SCOTT'S 1896 COAST PILOT FOR THE GREAT LAKES.

Courses and sailing directions.

For sale by the MARINE REVIEW.
Telephone 472.

409 Perry-Payne Bldg.,
Cleveland, O.

Also by George Scott, P. O. Box 397, Mount Clemens, Mich.

The COAST LINE to MACKINAC



TO MACKINAC
DETROIT
PETOSKEY
CHICAGO

2 New Steel Passenger Steamers

The Greatest Perfection yet attained in Boat Construction—Luxurious Equipment, Artistic Furnishing, Decoration and Efficient Service, insuring the highest degree of

COMFORT, SPEED AND SAFETY.

FOUR TRIPS PER WEEK BETWEEN

Toledo, Detroit & Mackinac
PETOSKEY, "THE SOO," MARQUETTE, AND DULUTH.

LOW RATES to Picturesque Mackinac and Return, including Meals and Berths. From Cleveland, \$18; from Toledo, \$15; from Detroit, \$13.50.

EVERY EVENING

Between Detroit and Cleveland

Connecting at Cleveland with Earliest Trains for all points East, South and Southwest and at Detroit for all points North and Northwest.

Sunday Trips June, July, August and September Only.

EVERY DAY BETWEEN

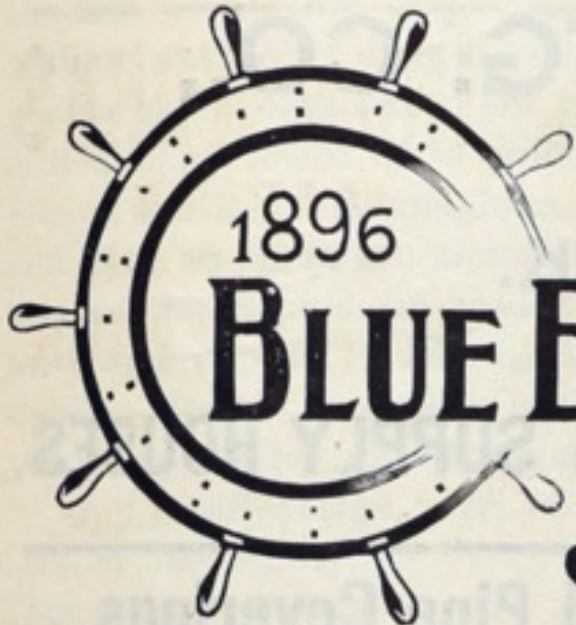
Cleveland, Put-in-Bay & Toledo

Send for Illustrated Pamphlet. Address

A. A. SCHANTZ, G. P. A., DETROIT, MICH.
The Detroit and Cleveland Steam Nav. Co.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.
320 ATWATER STREET,
DETROIT, MICH.



BLUE BOOK OF AMERICAN SHIPPING.....

It contains Lists of Names—Owners, Captains and Engineers—for Circularizing Purposes, any one of which is worth the price of the book, \$5.

Money refunded if book is not satisfactory.

PUBLISHED BY THE

MARINE REVIEW,

409 Perry-Payne Building,
CLEVELAND, OHIO.

Answers questions arising daily in regard to the management of lake vessels.

BAR IRON THE BOURNE-FULLER CO. PIG IRON

CLEVELAND, O.

BOILER RIVETS, BOILER TUBES, IRON PIPE,

SALES AGENTS:

THE CARBON STEEL CO.

MANUFACTURERS OF

OPEN HEARTH STEEL

SHIP, BOILER, BRIDGE AND
TANK PLATES, &c., &c.

BOAT SPIKES,
CLINCH RINGS, &c.

HIGH GRADE MATERIALS FOR
VESSEL CONSTRUCTION
A SPECIALTY.

SALES AGENTS:

THE CAMBRIA IRON CO.

MANUFACTURERS OF

OPEN HEARTH

AND BESSEMER STEEL

ANGLES, BARS, CHANNELS,
BEAMS, TEES, ZS, &c.

De Grauw, Aymar & Co.,
34-35 South Street,
NEW YORK, N. Y.



Sole Selling Agents
in the
United States
for

**TYZACK'S
STOCKLESS ANCHORS**

Over 40
of these Anchors
on Lake Vessels.

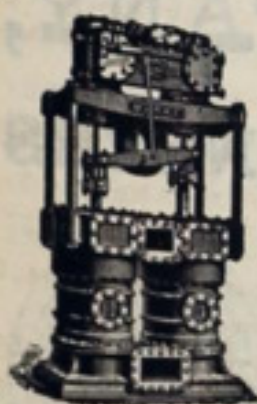
UNITED STATES ENGINEER OFFICE, 366
Milwaukee street, Milwaukee, Wis., Sept.
1, 1896. Sealed proposals for dredging 70,000 cubic
yards, more or less, at Menominee River, Wis.,
and Mich.; 200,000 cubic yards, more or less, at
Green Bay Harbor, Wis., will be received here
until 12 o'clock noon, Oct. 6, 1896, and then pub-
licly opened. Information furnished on appli-
cation. GEORGE A. ZINN, Capt. Engrs.
Oct. 1.

THE GEO. F. BLAKE MFG. CO.

BUILDERS OF

MARINE PUMPS

Single and Duplex Pumps for Boiler Feed,
Fire or Bilge Service—Vertical and Horizontal.
Vertical and Horizontal Pumps, Air Pumps
for Surface and Jet Condensers.



AIR PUMP ON
U. S. CRUISER NEW YORK.

95 and 97 Liberty St., NEW YORK.

Steamboat Fuel at Ashtabula.
Large Supplies of Best Quality.

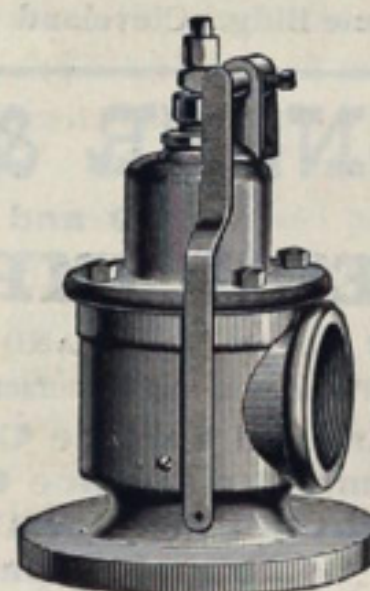
Lighter

Carrying
Different
Grades
at all
Times.



M. A. HANNA & CO.,

Main Office, Perry-Payne Bldg., Cleveland. **Miners and Shippers.**



CROSBY STEAM GAGE AND VALVE CO.,

Sole Proprietors and Manufacturers of

Crosby Pop Safety Valves and Water Relief Valves. Crosby Im-
proved Steam Gages, Single Bell Chime Whistles, Patent
Gage Testers, Victory Lubricators, and other specialties.
The Crosby Steam Engine Indicator, when required, is fur-
nished with Sargent's Electrical Attachment, by which
any number of diagrams can be taken simultaneously.
BRANDEN PUMP VALVES, rubber with wire-coil insertion.
Manufacturers of all kinds of Pressure and Vacuum Gages,
Water Gages, Gage Cocks, Radiator Cocks, and other
Engine and Boiler Fittings and Supplies.
Branch Offices at New York, Chicago and London,
Main Office and Works at BOSTON, MASS



Peerless Piston and Valve Rod Packing

IN SPIRAL FORM OR IN COILS.

WILL HOLD 400 LBS. STEAM.

20 YEARS OLD AND NO EQUAL.

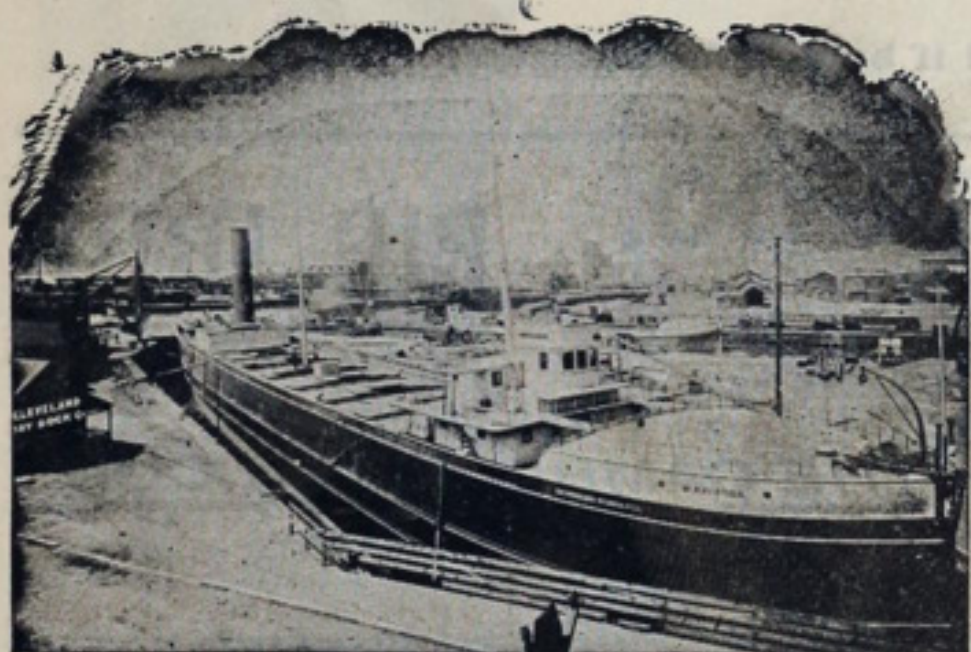
Manufactured Exclusively by

PEERLESS RUBBER MFG. CO.,

16 Warren Street, NEW YORK.

FOR SALE by the LEADING SHIP CHANDLERS and SUPPLY HOUSES.

The Cleveland Dry Dock Co.



148 Elm St.,
Cleveland, O.

Telephone 1616.
Resid. 'Phone 4080.

REPAIRING A
SPECIALTY.

Dimensions of Dock:
Lth. over all, 360 ft.
Lth. on blocks, 340 ft.
Width of gate, 50 ft.
Depth over sill, 20 ft.

Capt. W. W. BROWN
Sec'y & Mgr.

H. W. Johns' Boiler and Pipe Coverings.

ASBESTOS
MATERIALS
OF
ALL KINDS.

Wicking,
Fibre,
Mill Board,
Felt,
Packing,
Cement,
Liquid
Paints,
Roof Paints,
Fire-Proof
Paints, etc.

Made in Sections Three Feet Long, to Fit
Every Size of Pipe.
ABSOLUTELY FIRE-PROOF.



THE CHASE MACHINE CO.

111 ELM ST.

H. W. JOHNS MFG. CO.

32 SOUTH WATER ST.

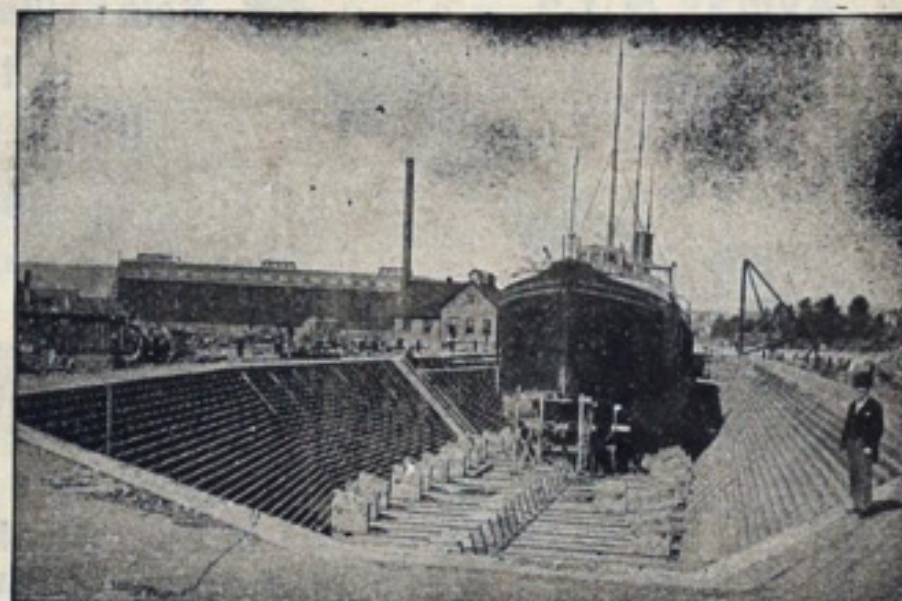
AMERICAN STEEL BARGE CO.

STEEL and METAL SHIPS

Of all classes built on the Shortest Possible Notice at our yards at
West Superior, Wis., and also at Everett, Wash.

Photograph of 300 ft. Boat in Dock.

Plates &
Material
Always
on hand
to Re-
pair all
kinds of
Metal
Ships in
Shortest
Time.



Best
Quality
of Oak
instock
for Re-
pairing
Wooden
Vessels
of all
Classes.

SIZE OF DOCK.

Length, extreme.....537 feet.	Entrance, Top.....55 feet 9 in.
Breadth, Top.....90 " 4 in.	Entrance, Bottom.....50 "
Breadth, Bottom.....52 "	Depth over Sills.....18 "

LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports
SUPERIOR, WIS.

A number of Propellor Wheels in stock at Dry Dock.



IRON OR STEEL FORGINGS FINISHED COMPLETE, ROUGH MACHINED OR SMOOTH FORGED ONLY, OF ANY WEIGHT.
COUPLING LINKS AND PINS. PRESSED WROUGHT IRON TURNBUCKLES. CAR IRON SPECIALTIES.

Artistic Photographs.

The REVIEW has a photographer, the best on the lakes, engaged in taking photographs of vessels passing through the Detroit River. Large pictures. No objectionable background. Let us have your order.

409 Perry-Payne Bldg., Cleveland.

WHEELER CONDENSER & ENGINEERING COMPANY,

39 and 41 CORTLANDT STREET, NEW YORK.

WHEELER'S IMPROVED SURFACE CONDENSERS

MOUNTED UPON COMBINED AIR AND CIRCULATING PUMPS.

Sole Proprietors and Manufacturers of the

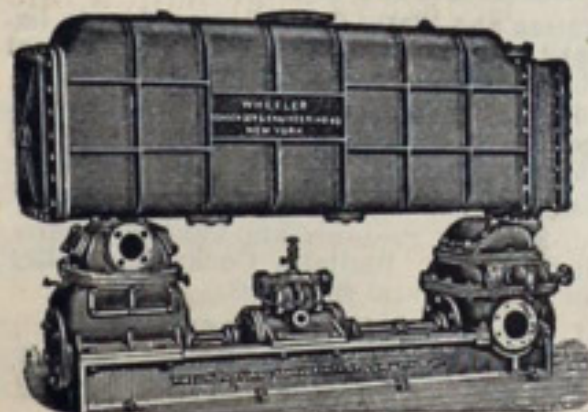
Wheeler Standard Surface Condenser.

Wheeler Admiralty Surface Condenser.

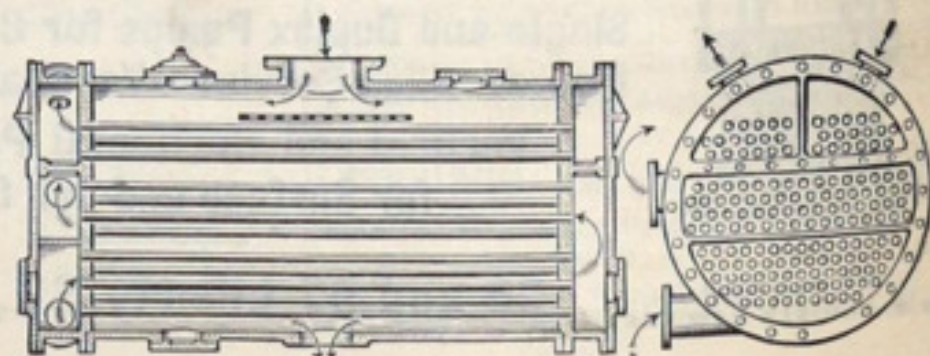
Wheeler Lighthall Surface Condenser.

Volz Patent Combined Surface Condenser
and Feed Water Heater.

Wheeler's Improved Marine Feed Water Heater.



Wheeler Surface Condenser.
Mounted on Combined Air & Circulating Pumps.



Patent Combined Surface Condenser & Feed-Water Heater